

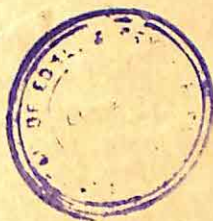
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LANGUAGE ARTS AND FINE ARTS



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Vol. XXII, No. 2

April 1952

Language Arts and Fine Arts

Reviews the literature for a three-year period since the issuance of Volume XIX, No. 2, April 1949, with the exception of music and foreign languages in which a six-year period is covered.

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Vol. XXII, No. 3

June 1952

Teachers and Nonacademic Personnel

Reviews of the literature for the three-year period since the issuance of Vol. XIX, No. 3, June 1949.

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Vol. XXII, No. 5

December 1952

Growth, Development, and Learning

Reviews of the literature for the period since the issuance of Vol. XX, No. 5, December 1950, and other issues dealing with similar topics.

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FOREWORD

THIS issue of the REVIEW follows the general pattern in the language arts and fine arts cycle. Increased research activity justified a separate chapter in reading in high school and college. Since both music and foreign languages were omitted in the 1949 issue, the current chapters review research for a six-year period.

The usual short-term status studies and experiments using conventional measurement technics seem to predominate most current language arts research. Altho there are occasional ventures into new procedures, there is a need for increased ingenuity in the development of instruments of evaluation, a greater amount of pioneering in variety of approaches to effective teaching. Perhaps some sacrifice of objectivity may be necessary to gain greater validity in the analysis and evaluation of higher mental processes and affective qualities in language arts. New analytical measures are needed even in the more routine abilities such as comprehension, oral and written recall and expression, vocabulary development, sentence and paragraph structure, and perceptual abilities related to language growth. The evaluation of larger aspects of language arts teaching, perhaps thru closer cooperation between research centers and public schools, should indicate leads for improving practice. It seems strange that the constant output of textbooks is unaccompanied by research to discover their effect upon learning. New courses of study, new methods, new types of organization for instruction, and other ventures might be studied to discover whether or not children are better served by them.

There appears to be a greater duplication of effort in language arts research than is desirable. The large amount of research output buried in unpublished master's and doctoral studies makes it most unfortunate that the U. S. Office of Education has been unable in the past decade to publish the *Bibliographies of Research Studies in Education* which enabled research workers to keep in closer touch with areas of special interest in the various centers.

There are, however, evidences of pioneering in curriculum, materials, methods, and evaluative technics in each chapter of this REVIEW which should encourage a more venturesome era of language arts research.

DONALD D. DURRELL, *Chairman*

CHAPTER I

Research in Reading in the Elementary School

MARGARET LEE KEYSER

MANY articles and several professional books dealing with developmental reading at the elementary level have appeared since the last review of the research in April 1949 (17). Much of this literature dealt with (a) philosophy of the teaching of reading, (b) explanations of technics and methods, (c) descriptions of reading programs, (d) summaries of research, and (e) bibliographies.

Many of the contributions to the literature are of great value to workers in the field of reading, even tho they cannot be classified as research. Notable among these are reviews of the research such as those by Betts (4), Johnson (33), and Traxler (61), and bibliographies compiled by Gray (22, 23, 24), Dale (15), and Smith (55, 56). Several classroom teachers have reported descriptions of programs and technics which have proved effective and interesting. Reports from various conferences have also added to the literature.

Among the books which dealt with a specific aspect of instruction are those in the area of readiness contributed by Monroe (43) and Hildreth (28), and one dealing with word analysis by Gray (21). Professional books by Adams, Gray, and Reese (1), and Russell (51), gave emphasis to methods of instruction. Bond and Wagner (7) and Broom and others (10) revised previous editions. *The Forty-Eighth Yearbook* of the National Society for the Study of Education (44) related child development to many general problems in reading. In addition to these, Olson (45), and Breckenridge and Vincent (8) devoted considerable space to problems of learning in general, and reading specifically, in their books on child development. Brickman (9) reviewed books in the field of reading considered suitable for college texts.

The published research during this three-year period may be classified as (a) status studies, (b) investigations of the materials of instruction, (c) studies dealing with instruction and achievement, and (d) comparison and criticisms of various measuring instruments.

Status Studies

Reading was the primary factor for investigation in several of the status studies. Wheeler (63) used test results and observations to evaluate the teaching of reading in Grades I thru XII in a county in Alabama, and concluded that at no time was the yearly average gain as much as one grade, and that the amount of retardation increases in Grades IV thru VIII. Birch (5) reported a comparison of reading scores of British children in 1947 and 1949. These results show a sharp decrease in reading retardation.

An investigation is being made of the reading abilities of good and poor readers in Grades I thru XII in eight school systems in the state of New York. The two studies available followed similar procedure in selection of cases, and in identifying strengths and weaknesses in reading. Pupils were selected on the basis of teacher judgment and test results. The *Durrell Analysis of Reading Difficulty* was administered to all the subjects, and errors noted. Sheldon and Hatch (53) reported that for Grade III there were some reading errors and some strengths common to both good and poor readers. Hatch and Sheldon (26) concluded that for Grade IV both good and poor readers read more rapidly silently than orally, and that there were some errors common to both.

Among the status studies which included an analysis of reading was one reported by Chase (14), who investigated the subject preferences of 13,483 fifth-graders in New England and 2350 pupils in a southwestern city. Results showed: (a) that for both populations reading was the preferred subject, and that there was no significant difference between boys and girls for this preference; (b) only the group which made reading its first choice was significantly superior in achievement over the total fifth-grade group; and (c) in comparing high and low achievers, a significant difference in favor of high achievers was found for pupils who preferred reading. Tiegs (59) compared pupil achievement in the basic skills for 230,000 cases tested before and after 1945. Data based on results from *Stanford Achievement* and *Progressive Achievement* tests were included from 60 communities in seven states. After taking into account certain limitations, Tiegs concluded that, contrary to popular belief, achievement of pupils was not falling; in fact, there was a slight gain in achievement.

In a study of teacher awareness of listening, Wilt (64) also investigated the relative importance teachers place on four phases of language education. She reported that 62 percent of the teachers ranked reading as the most important phase. Teachers estimated that pupils spent 36 percent of school time in learning thru reading.

Instructional Materials

Investigations concerned with instructional materials dealt primarily with studies of vocabulary and content. Kearney (35) analyzed the vocabulary of 121 first-grade books published between 1930 and 1940. He counted the number of different words and the number of running words at each level. Listed also are the most common 200 words in each category. MacLachy and Wardwell (37) also studied vocabulary of first readers published between 1930 and 1940, and listed the 150 most commonly used words in first-grade books, arranged according to appearance in primers and first readers, and according to parts of speech. Gentry (20) also compiled a common word list based on frequency of occurrence of words in preprimers. Two lists of preprimers were given, one according to percentage of words in the common word list, and one according to vocabulary

load. Vernon (62) studied seven series of books used in the Glasgow schools, and listed the total number of words, frequency of occurrence of each word, and the average repetition. Hughes and Cox (30, 31) compared the vocabulary of four basic readers with the spoken language of pupils of first grade. Children's language during the sharing period was recorded for 42 days over a period of three months. The language of the children and the vocabulary of readers were analyzed to determine the total number of words, average sentence length, and vocabulary differences according to six common categories. They substantiated previous findings: (a) that there is an extensive overlapping in vocabulary of readers and pupils' spoken language, and (b) that pupils use more words in speech than are used in readers. One of the great differences noted was in the vitality of children's language and that of books. The authors listed several implications for teachers and writers of textbooks. Read (50) obtained statistics on the number of pictures which appeared in 115 basic readers available in 1945. The author expressed approval of the quality of the pictures; he pointed out that as the level of the reader goes up, the pictures lose more and more importance, and that between Grades II and III the function of the picture changes.

Another study by Read (49) investigated the amount of science content of 121 basic readers available in 1946, counting pictures, text, outlines, and questions. Sixteen scientific topics appeared in the books, utilizing about 17 percent of the pages. The total number of pages devoted to science content was analyzed in relation to three types of presentation: (a) narrative, 9 percent; (b) exposition, 8 percent; (c) experiment, less than 1 percent. The writer cited omission of many important topics such as sound, safety, health, and lighting.

The reading difficulty of science textbooks was studied by Mallinson, Sturm, and Patton (38). The Flesch readability formula was applied to five series of science books for Grades IV, V, and VI, and the reading difficulty score for each book was listed. None of the books could be classified as easy, and in nine books, passages in earlier parts of books were more difficult than those in later portions. The books designed for use in Grade VI were only slightly difficult, the books for Grades IV and V were rather difficult. The writers gave no reason for selection of this particular technique for evaluation.

Instruction and Achievement

Almy (2) investigated children's experiences prior to first grade by interviewing both the children and the children's parents. Children's achievement in reading was evaluated by use of teacher's ratings, *Gates Primary Reading Tests*, and *Kuhlman-Anderson Test of Intelligence*. One hundred and six pupils attending half-day sessions comprised the population. She reported that a significant positive relationship existed between

success in beginning reading and the pupil's responses to opportunities for reading prior to first grade, and that interest in one kind of reading goes with interest in another kind of reading. A significant relationship was not found between beginning reading success and either mental age or occupational status of the parents.

Ilg and Ames (32) reported the results of a study of reading behavior of children up to 10 years of age. This was not a statistical study, but an observational one involving 50 cases up to five years of age and 30 cases up to 10 years of age. Readiness tests and oral reading tests were also administered at appropriate age levels. The responses of subjects were analyzed to determine components of a "reading gradient" which would present a step by step outline of the path which a child follows in his reactions to pictures and words on thru fluent reading, giving particular attention to order and errors. Sex differences in performance were also noted. The authors listed a reading gradient at various ages from 15 months to nine years, and reading errors by types at each age level from five and one-half thru nine years.

Taylor (58) compared reading of Scottish children with American children to determine the effect of training the Scottish children received during the first year of school. Using the *Metropolitan Readiness Test*, Scottish children and American children of the same chronological age were compared (5). The Scottish children had been in school one year. The reading achievements of Scottish children (C.A. 6) and American children (C.A. 7) were compared on the basis of results obtained from the *Metropolitan Achievement Test*. One hundred and fourteen Scottish children of average intelligence were used, and norms of the Metropolitan tests were used to represent average American scores. On the readiness test, a highly significant difference in favor of the Scottish group was found, and there was marked improvement of Scottish children in perception of similarities, copying, and number. A highly significant difference in favor of the Scottish group for reading achievement was also reported. The author infers that success in reading depends at least as much on training as on maturation. Tho these results can hardly be regarded as conclusive, they would appear to justify a more extensive investigation.

The relationship of perception of symbol orientation and early reading success was investigated by Potter (47) who concluded that guidance in observation which will cause pupils to note details in a sequence pattern is required if children are to improve in their ability to discriminate between confusingly similar words. She added that ability to avoid mirror errors is a crucial ability for early reading success.

On the basis of findings of six studies dealing with children's ability to read diagrammatic symbols, Malter (39) concluded that interpretation of diagrammatic symbols is an acquired skill, and thus more emphasis might be placed on the meaning of these symbols thruout the grades.

Fay (19) tested extensively 384 pupils at the sixth-grade level to de-

termine the relationship between five specific reading skills and success in social studies, science, and arithmetic. Data were analyzed to determine differences for each reading skill in each area of achievement for both inferior and superior readers. Superior readers were significantly better than inferior readers for four reading skills in the achievement area of social studies and for two reading skills in science. In the relationship between the five reading skills and success in arithmetic, no significant differences were evident between superior readers and inferior readers. From these findings Fay implies that achievement should be considered in terms of specific areas, and that reading should be thought of as a composite of many specific skills rather than a generalized ability.

A year's intensive work on the study skills for 264 pupils in Grades IV thru VIII was evaluated by Howell (29). In this school, the departmental system was used, and grades were divided into fast and slow sections on the basis of intelligence, achievement, and teacher opinion. The *Iowa Every Pupil Tests of Basic Skills* were used both for diagnosis and measurement of achievement. Units of work were taught by the librarian during the weekly library period and the teacher correlated unit plans with the curriculum. On initial testing, most of the fast groups had acquired skills even tho they had not been emphasized, but slow groups were about a year below grade norms. At the end of the testing period, the slow groups showed the greatest improvement, and many individual cases showed remarkable gains.

The reports of two investigations of the relationship between speed of reading and comprehension pointed out that this relationship is dependent upon other factors. Shores and Husbands (54) obtained three rate scores for 90 pupils in Grades IV, V, and VI, using a test constructed by the authors. They found little or no relationship between any of the three measures of speed of reading and comprehension. They concluded that the relationship between speed of reading and comprehension depends to a large extent upon purpose set for reading and the nature of the reading material. Using 330 fifth-grade pupils, Carlson (12) tested speed of reading at different levels of difficulty and with varying continuity of context. Data were analyzed for fast and slow readers, and for three categories of intelligence. He concluded that accuracy of comprehension was dependent upon levels of intelligence, purposes for reading, levels of difficulty of materials, opportunities for referral in answering comprehension questions, and continuity of context. At the upper levels of intelligence the rapid readers were the more efficient, but at middle and lower levels of intelligence the slow readers tended to be the better readers.

There has been much conjecture about whether radio programs have any effect on ability of pupils to concentrate on their studies in order to acquire knowledge and information. Mitchell (41) determined the favorite musical program and favorite variety program of 91 sixth-grade pupils by use of a questionnaire. These programs were recorded and played during the testing periods. A silent reading test was administered without a

program, with a musical program, and with a variety program. The reading achievement of the whole group was adversely affected by the variety program, but not by the musical program. Reading achievement of pupils with an IQ above 100 was not adversely affected by the variety program, and showed a significant gain during the musical program.

Edmiston and Benfer (18) investigated the relationship between group achievement and ranges of abilities within groups, using 462 pupils in Grades V and VI. Groups with wide range of intelligence (41.24 IQ points) and narrow range of intelligence (29 IQ points) were established. There were 233 pupils in each group, with 104 IQ as average intelligence for each group. Reading achievement was measured at six-month intervals, and differences computed. A critical ratio of 4.33 favored the wide-range group.

Reported in a single study was (a) a comparison of the two most popular methods of teaching in Glasgow, and (b) the effect of socio-economic status on reading achievement at beginning stages. McLaren (36) described the methods of teaching and establishing socio-economic status. Achievement was measured by an author-constructed picture and word comprehension test. There was no significant difference in achievement for pupils taught by the two different methods. However, socio-economic status affected reading achievement at the early levels, but there was overlapping in scores for various groups.

Anderson (3) investigated general and specific vocabulary ability to determine the relationship between vocabulary and a pupil's group status, and found vocabulary could not be used to predict individual status at either the sixth- or ninth-grade level. In a much more extensive study, Mitchell (42) investigated the relationship between amount of reading children do and the social acceptability of 873 sixth-grade children. Readership and social acceptability were measured from the point of view of parents, teachers, and children. A "guess who" type of test gave pupil opinions concerning reading and social acceptability of children. Both teachers and parents indicated on a behavior rating scale the children's social acceptability, and on an information blank, the children's readership. Numerical values were assigned to derived scores. Intercorrelation coefficients for the 15 variables were computed. Mitchell concluded that extensive reading is a significant factor in children's social acceptance. Whether or not it is a causal factor was not determined.

That girls are superior to boys in reading achievement in elementary school is generally accepted. This generalization is substantiated in an investigation by Carroll (13) who found significant differences in favor of girls for reading achievement and visual discrimination. Ilg and Ames (32) reported also that girls as a group appear to be advanced over boys as a group at every stage of the reading gradient. A trend toward more equal achievement of girls and boys is noted in several studies. Potter (47) noted no significant sex differences in directional drawing, perceptual discrimination, or reading. No significant differences in boys and girls

scores on reading comprehension or word recognition was reported by McLaren (36). In a study of children's voluntary reading, Dunlop (16) reported that girls read more than boys, but Wollner (65) reported no sex differences in voluntary reading activity. Butterworth and Thompson (11) found pronounced sex differences in children's preferences for comic books.

Investigations of recreational reading can be classified into studies of tastes and interests, attitudes, and those concerned with comics. Wollner (65) reported a study of voluntary reading of eighth-grade pupils of high socio-economic status, and of average and superior intelligence. For each pupil, extensive data concerning reading ability, tastes, interests and habits, school history, personal data and home information, were available or obtained. Data were analyzed to obtain general trends, but individual pupils were studied to determine deviations from generally established patterns. Positive relationships were found between attitudes and reading activities, and intelligence and reading, but detailed study showed many and extreme deviations. She concluded that correlations obtained in this study are too low to permit safe generalizations, and the study of individual cases shows the voluntary reading of an individual to be unique.

Dunlop (16) investigated children's leisure reading thru studying book withdrawals and by interviewing 100 boys and girls ranging in age from 7 to 17 years. Analysis of data revealed that children exercise freedom of choice in leisure reading, and read more fiction than nonfiction. Years 12 and 13 are the peak years for reading.

In connection with school appraisal, a lack of supplementary reading materials was noted. The question arose as to how much the books would be used if made available. Mauck and Swenson (40) reported the use made of 171 books when made available to 364 pupils in Grades IV thru XII. The reading was entirely voluntary, and no requirements related to the reading were made. In the three weeks the books were available, the average number of books read was about six, and lower-grade pupils read more than upper-grade pupils.

Six- and seven-year-old children's acquaintance with the vocabulary of comics was studied by Sister Jude (34). She compared the speaking vocabulary of children and the infant reader vocabulary with the vocabulary of comics popular with Scottish pupils. She reported the percentage of irregularities of language in comics is quite small (6 percent) and that there was a relatively high overlap with words in readers and speaking vocabulary.

Butterworth and Thompson (11) investigated age-grade and sex differences trends of children's preferences for comics. In Grades I thru XII, 1256 pupils listed books liked and disliked. From this preference list, 25 books were selected for study to determine the relative popularity of books, and relationship of popularity of books to content factors. Information concerning frequency and volume of comic book reading was obtained from publishers' sales reports, and questionnaires submitted to the chil-

dren. There were definite age-grade trends in preferences and also a fairly consistent downward trend from grade to grade in reading volume. Peak reading and buying volume seems to occur at Grade VI.

Only one study of reading for the bright child was found. Shearer and Fannin (52) describe an enriched program for pupils in Grades V and VI which was carried out for eight months. Unmeasurable outcomes, such as knowledge of literary forms and terms, growth in related fields of reading, science, travel and history, and appreciation of the world's literature, were considered to be of great value. Measurable gains by standardized tests, however, appeared low.

Measurement

Research in the area of measurement dealt with comparisons, criticisms of tests, and uses of test results. Traxler (60) made a critical survey of 28 silent reading tests which could be used as diagnostic measures. If a test yielded three or more separate scores it was considered diagnostic in nature. Forty-nine types of reading ability were tested with the 28 tests, which Traxler judged to be fairly reliable, valid, and useful instruments. He stated that the diagnostician is more important than the test, and that no one test thoroly measures all kinds of reading ability. Pflieger (46) compared the scores of 301 eighth-grade pupils and found that pupils ranked 1.1 grades higher on the *Stanford Achievement Test* than on the *Iowa Silent Reading Test*, but that both tests ranked pupils in the same order. In comparing the oral reading tests of the *Durrell Analysis of Reading Difficulty* and *Gray's Oral Check Test*, Spache (57) concluded that both tests seem fairly well constructed. He includes suggestions for use of the Gray and Durrell tests so that results will be directly comparable. Bond and Fay (6) compared performance of good and poor readers on the individual items of both forms of the *Stanford-Binet Scale* using 50 cases in Grades IV, V, and VI.

In using the *Lee-Clark Reading Readiness Test* and experienced teachers' opinions Henig (27) found both to have a substantial degree of success in predicting the outcome of children's first year of reading when teachers' marks are used as indicators of success in reading performance.

Differences in prediction of success for kindergarten and nonkindergarten groups were investigated by Pratt (48). He reported a significant difference in favor of the kindergarten group for both the readiness test and the reading achievement test results, even tho there was no significant difference in mental age of the groups.

Greene and Woodruff (25) described a technic for increasing the efficiency of supervision. Using test results, a remedial instruction program was planned, and the supervisor directed her attention to improving instruction in specific areas. They reported twice as much progress in reading occurred as might have been expected for the six-month experimental period.

Needed Research

The research in elementary-school reading was very meager in several areas. There were few reports of investigations dealing with various aspects of reading for special groups, such as superior children. The studies concerned with vocabulary were primarily counts of different words, parts of speech, and frequency of occurrence of words, rather than giving attention to problems of meaning and sight vocabulary. Technics of instruction and comparison of various methods of teaching were also neglected areas.

The increasing number of studies which found no differences in boys' and girls' performance in reading calls attention to the need for more research in this area. If the achievement is now more nearly equal for the sexes, changes in aspects of instruction and factors influencing this change in performance should be identified.

Reports of the superior reading achievement of Scottish children points to the need for more studies of the maturation factors and aspects of training which produce success in beginning reading activities. More detailed descriptions of the program of instruction in reading for Scottish children and a comparison of the emphasis given to various areas of instruction may give some insight into this superior achievement.

How to make available more of the unpublished research is a continuing problem.

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CHAPTER II

Research in Reading in High School and College

FREDERICK B. DAVIS

Introduction

RESEARCH studies in reading at the high-school and college levels continue to appear in large numbers. Gray (34, 35) discussed seven contributions of research in the field of reading and summarized significant findings in his article on reading in the new *Encyclopedia of Educational Research*. Durrell (19) outlined recent trends in the teaching of reading. Witty (118) published a new manual for teachers and others in the field.

Bibliographical Materials

Gray (36, 37, 38) continued his annual summaries of reading investigations. Traxler (106) surveyed important research studies in reading made in the United States, stressing work done since 1930. The April 1949 issue of the REVIEW OF EDUCATIONAL RESEARCH included chapters on "Research in the Teaching of Literature" by Burton (9), "Research in Reading" by Durrell and Murphy (20), and "Visual and Related Factors in Reading" by Eames (24). Dale (16) prepared a *Bibliography of Vocabulary Studies* while Husbands and Shores (48) summarized research relating to the nature of reading ability and drew implications from the data regarding the measurement of this ability. Hildreth (43) presented a long bibliographical review of the literature relating to the development and training of hand dominance.

Training Studies

Descriptions of Diagnostic and Teaching Methods

The procedures followed in a number of remedial centers and reading clinics have been described in the literature. Surveys of procedures currently in use were made by sending out questionnaires despite the known hazards of this technic.

Boyd and Schwiering (7) reported data obtained from 76 replies to 200 questionnaires sent to psychological clinics, Barbe (5) presented information from questionnaires sent to colleges regarding their programs for helping deficient readers, and Brink and Witty (8, 120) analyzed the responses of 109 school systems out of 500 to whom questionnaires were sent concerning the objectives and nature of remedial instruction in secondary schools.

Sechriest (87), Swenby and Zielsdorf (95), and Jones (52) described remedial programs in secondary schools with which they are associated; the work of the Reading Laboratory at Howard College was outlined (86), reflecting an emphasis on speed of reading. Persons and Grumbly (76) suggested that clients in reading clinics be given group guidance as part of their program of work. Blayne (6) recommended the use of student-made graphs of progress in speed and comprehension. Certain of the data reported by him should be interpreted with caution since he used scores expressed as percentiles in computing product-moment correlations.

Results of Remedial Programs

Data showing the effect of remedial programs on high-school and college students were presented by Baker (4), Charles (13), Gunzburg (40), McGinnis (65), Redmount (80), Schleich (85), Staton (92), Trimmer and Corman (109), Westover and Miller (113), and Williams (117). Watts (111) reported the gains in reading resulting from a rather unusual remedial program during which the students were given case studies of various sorts as reading exercises.

Robinson (81) advocated the use of improvement in college grades as a criterion for judging the effectiveness of remedial work and presented data showing that Yale students who had remedial training obtained better grades than men of similar ability who had not taken the remedial work. McGinnis (64) reported similar data with students at the Western Michigan State College. Altho students in these experiments were matched with respect to ability, they were not matched with respect to motivation since remedial work was optional. Hence, conclusions about the effectiveness of remedial training for improving college grades should be drawn with great caution.

Murphy and Davis (71) provided evidence that all studies reporting gains as a result of remedial work should be regarded skeptically since common methodological errors lead to false indications of progress. Tests used in measuring progress should be corrected for chance success and scores should be corrected for regression to the population mean whenever the remedial group is selected because of low test scores.

Eye-Movement Training

The use of visual aids, such as mechanical devices, for remedial work in reading was discussed by Holland (44), Orent (74), and Speer (91). Three valuable studies in this area were made by Freeburne (30), Glock (31), and Lewis (58). Freeburne summarized a doctoral dissertation in which he found that training in perceptual speed and span with a flash-meter did not cause greater improvement in the reading ability of college students than the mere taking of certain perceptual tests. It appears from Glock's study that remedial instruction designed specifically to train eye

movements is generally no more effective than two other types of remedial instruction. No single method worked best for all teachers involved in the study. Lewis showed that when two groups of adults, matched case by case on initial reading speed, were trained by two different methods, the group trained in comprehension made a gain in *speed* of reading almost three times that of the group trained with eye-movement exercises.

Physical Factors Related to Reading

Typography

Two additional studies on the relation of typography to reading were reported from the Minnesota Psychology Department by Tinker (98) and Tinker and Paterson (100). They suggest that nine-point type be set in lines 14 to 30 picas in length with one to four points of lead. North and Jenkins (72) experimented with what they call spaced-unit typography and found it superior to either conventional or square-span typography. Burt (10) reviewed research on the attainment of maximum legibility.

Ocular and Other Physical Factors

Eames (21) studied the effect of correcting various degrees of refractive error and found that speed of object perception and speed of word perception tends to increase after correction. In general, slight amounts of farsightedness justify correction more than equal amounts of nearsightedness. He also pointed out that disease or physical defects were found to be 21 percent more frequent among 875 children who were considered to be failing than among 486 children considered to be succeeding in reading (22). Data that led Tinker (99) to believe that blink rate is not a valid criterion of ease of seeing were reported. Robinson (82) discovered that the *Binocular Reading Test* identifies eye dominance when suppression (of vision in one eye) occurs in binocular reading. She suggested that *Gray's Oral Reading Check Tests* do not provide reliable evidence of visual defects. Joslin (53) discussed physical factors in reading.

Ewers (27) reported the correlations of 43 auditory tests with scores from the *Iowa Silent Reading Test* and *Gray's Oral Paragraphs Test*. The coefficients spread over a surprising range. In a sampling of children six to 16 years of age, Kendall (54) found no significant relation between retardation in reading and difficulty in visual-motor integration. Strother (94) recorded muscle-action potentials during the reading of materials expressive of four basic emotions.

Studies of Readability

Three studies employing Flesch readability formulas were published during the period covered by this review. Hayes, Jenkins, and Walker (42)

studied the reliability of the formulas and found it to be good for word and sentence length and for reading ease but to be rather low for personal sentences, and thus human interest. Farr (28) recommended the formulas for preparing employee handbooks and Lyman (61) reported that readership of material written with Flesch counts of 1.5 and 3.5 was greater for the easier version. Lorge and Kruglov (60) concluded that the structural elements of pupils' compositions were not related significantly to verbal (or general) intelligence when educational level was held constant and the range of talent was small. An excellent evaluation of readability formulas was provided by Lorge (59).

An interesting study of five factors that account for starting readership by men of articles in the *Saturday Evening Post* was made by Perloff (75).

Reader Interests

A few experimental studies of the reading preferences and interests of junior high-school and high-school pupils should be mentioned: Norvell's book (73), Wollner's doctoral dissertation (121), and articles by McCarty (62), Stewart (93), Shatter (89), and Powell (79). Jones (51) investigated the reading interests of students in a small southern college and found that only a small proportion of the students read magazines or papers written for educated adults. However, the proportion seems to increase from year to year thru the four undergraduate years of training.

Knepp (55) reported on the reading choices of high-school biology students, and Gunzburg (41) discovered that subnormal boys prefer to read about familiar scenes and places rather than about historical or foreign events.

Investigating the effects of television on leisure-time reading, Coffin (14) found that in the spring of 1948 the number of hours of reading per family per week was 21.3 in homes without television and 17.5 in similar kinds of homes with television. There was no difference in the kinds of reading done in the two groups of homes.

Comic Books

Two studies dealt with comics and juvenile delinquency. Thrasher (96) examined critically the claims of Wertham regarding the role of comics in causing juvenile delinquency and deplored the lack of scientific objectivity and thoroughness that seemed to him to characterize Wertham's writings on this topic. Houlst (45) established significant differences between two matched groups of delinquent and nondelinquent children in the Los Angeles area with respect to the reading of comic books. Delinquents read significantly more "blood-and-thunder" comics, of the type commonly regarded as harmful, than did nondelinquents.

Hutchinson (49) reported on the use of *Puck—the Comic Weekly* as instructional material in classrooms. Mitchell (68) constructed a vocabu-

lary test based on 44 words contained in comic strips and found that few pupils in Grades VII thru XII knew their meanings. The mean number answered correctly ranged from 8.4 in Grade VII to 29 in Grade XII.

Zorbaugh (122) discussed the results of a study designed to determine the opinions of adults with respect to comics for children. In general, comics are approved, but their faults have apparently been noted and discrimination in selecting them is exercised.

Personality Factors and Reading

A helpful review of research studies on the relation of personality difficulties to the reading process was made by Russell (84). Witty (119) summarized the evidence pertaining to the relationship of emotional disorders and reading difficulties and concluded that the causative factors of reading disability are complex and that emotional disorders are often, tho apparently not always, involved.

Ellis (25) conducted a follow-up study of 100 cases diagnosed as reading disability and found that improvement in ability to read depended on the amount and quality of remedial tutoring provided, the subject's intelligence, the severity of emotional disturbance, and the subject's age at the time of diagnosis. Older children improved more than younger children. Potter (78) concluded that reading therapy uses limits in much the same way as other types of therapy, but that "it differs from them in having specific as well as general aims for its clients, in using reading as content about which to structure its processes, and in making use of a special milieu to facilitate these processes."

Carter (12) suggested a possible means of differentiating between poor readers who need psychotherapy and those who need merely remedial tutoring. Feifel (29) obtained data which suggest to him that the scoring systems used for vocabulary tests are not sensitive enough to reflect qualitative changes resulting from psychosis. He presented a method for scoring qualitatively the first 10 words in the vocabulary test of Form L of the Stanford-Binet scales.

Oral Reading

Artley (3) discussed the relationships between speech difficulties and deficiency in reading, and Eames (23) prepared a short summary of selected references pertaining to this area.

Dearborn, Johnston, and Carmichael (18) found high positive correlations between comprehension in silent reading and ability to locate specific words in the text that the author considered worthy of special stress. These data link degree of comprehension and meaningfulness of oral presentation. Other data gathered and discussed by Anderson (2) and Wells (112) indicate that mechanical accuracy of oral reading is not significantly related to measures of reading comprehension or scholastic

aptitude. MacLatchy (66) discussed the use of tests of oral reading for appraising progress.

Seedorf (83) studied the problem of obtaining reliable measures of individual ability to interpret literature orally and concluded that the use of 40 or more judges was desirable for this purpose.

Comprehension in Reading

A survey of the literature pertaining to comprehension in reading was made by Johnson (50), who summarized and interpreted studies of the skills and abilities involved in reading. An ambitious investigation of certain factors associated with comprehension was reported in Hunt's doctoral dissertation (46). Hunt studied six skills proposed for measurement by Davis and found them to be highly correlated. Buswell (11) conducted an experiment to determine whether rate of silent reading varies directly with rate of thinking provided that perceptual factors in reading are held constant. The reviewer, using Buswell's data, found that a correlation of .59 between the best-weighted combination of the rate-of-reading and rate-of-thinking tests drop to .53 when four perceptual skills are held constant by partial correlation technics. These data indicate that rate of thinking and rate of silent reading, as both were measured in this study, are by no means closely related and are even less so than usual when certain perceptual factors are held constant.

Crossen (15) reported an interesting study showing that pupils' attitudes do have significant effects on their ability to comprehend material that arouses emotional feelings. Davis (17) stated again in nontechnical terms the main results of his factorial studies of comprehension in reading. Griffin (39) outlined a preliminary study of comprehension of news stories and Godfrey (32) recounted the difficulties that college students have in understanding literary writing and urged that emphasis be placed on developing the ability to read critically.

A factorial analysis of reading made by Anderson (1) led him to conclude that comprehension variance is 57.6 percent vocabulary, 13.2 percent intelligence, and 29.2 percent "analysis-synthesis ability." The last component is characterized by positive loadings in grammar and spelling tests and negative loadings in sentence structure and punctuation skill.

Studies of Reading Tests

A new test of auditory comprehension was described by Spache (90) and a new test of poetry discrimination by Eppel (26). Traxler (102, 104, 105) and Townsend (101) reported the reliability coefficients and inter-correlations of several reading-test scores, using small, highly selected samples. Traxler (103) also reported interesting data regarding the validity of three reading tests with ratings by teachers used as the criterion. The Cooperative Speed-of-Comprehension score (not to be confused with ordi-

nary speed-of-reading-words scores) showed markedly higher correlation with teachers' ratings of "how well pupils read material connected with their class work" than did the speed scores derived from the Iowa and Diagnostic reading tests. The vocabulary and total scores derived from the Cooperative and Iowa tests showed insignificantly different correlations with the teachers' ratings when the reviewer applied an exact variance-ratio test of the significance of the differences (a test developed originally by Hotelling and conveniently available on pages 54 and 87 of *Statistical Methods in Research* by Palmer O. Johnson). However, the validity of the Cooperative total reading score was the higher in the sample tested.

Tiegs (97) and Gray (33) showed that school children tend to achieve higher scores in reading at present than they used to in the past. Pflieger (77) reported that grade scores on the Metropolitan and Stanford reading tests are not exactly comparable—a result to be expected because of differences in the methods used to establish norms for these tests. Wheeler (114) noted that children in Morgan County, Alabama, generally fall below the national norms, a common situation in the South.

A follow-up study, using successive different forms of the *Cooperative Reading Comprehension Test* each year for six years, was reported by Traxler (104). He attributed irregularities in individual growth curves partly to errors of measurement and partly to the inner maturing of the pupils. In the reviewer's judgment, the importance of variations in pupil motivation should not be underestimated. Traxler (107) also studied sex differences on vocabulary-test scores and found none on tests of general vocabulary. Girls tended to do significantly better than boys on the vocabulary of English grammar and literature. Vernon (110) presented correlations between difficulty levels of vocabulary items and their frequencies in the *Teachers Word Book*. The coefficients range from .30 to .78, the correlations tending to be higher in samples of difficult words.

Relationships between reading-test scores and aptitude measures were obtained by Triggs (108), Wheeler (115), and Wheeler and Wheeler (116). Rundle (83) published data indicating that no correlation exists between speed of reading words and speed of typing. McClanahan and Morgan (63) investigated the utility of the *Nelson-Denny Reading Test* for predicting first-year engineering grades. Moser and Muirhead (69) studied the relationships between scores on the *Tests of General Educational Development* and grade last completed, using a sample of 1582 enlisted men in the army. The correlations are close to zero. Murphy and Davis (71) reported a significant, tho small, negative correlation between average freshman grades at George Peabody College for Teachers and ability to reason in reading, when vocabulary level is held constant.

Miscellaneous Studies

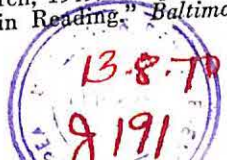
In an unusually interesting study, Krise (56) found that graduate students can be induced to make reversals in reading unfamiliar symbols.

The implications regarding theories advanced to explain reversals in reading among children were considered. Krise offered a simple explanation for reversals that is consonant with his data.

Hunt and Sheldon (47) defined certain characteristics of "good" and "poor" readers with IQ's of 90 or more. LaGrone and Barratt (57) conducted an experiment to determine whether relationships that had been previously noted between accuracy of perception in peripheral vision and intellectual abilities are partially a function of dextrality, and thus not wholly accountable for on the basis of habitual tendencies or sets acquired as a result of practice in reading. The authors conclude that they are. Experiments reported by Michael, Rosenthal, and DeCamp (67) on the effect of author prestige on the preferences of 120 Princeton students indicated that the literary attitudes of the group appeared to depend *not* on the prestige of the writers but rather on the individual's own tastes. These findings differ from those sometimes reported for experiments of this type.

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CHAPTER III

Research in Spelling and Handwriting

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Spelling

RESEARCH in spelling for the three years since October 1948 indicated a continued consideration of word selection and grade placement, an increased concern about methods of teaching spelling, and some attention to the integration of spelling with the other language arts.

The most complete survey of spelling research published in this period was Horn's invaluable summary of investigations relating to curriculums, methods, and testing reported in the revised edition of the *Encyclopedia of Educational Research* (14). The well-selected references compiled yearly in *Elementary School Journal* and *School Review* supplemented the basic triennial summaries in the REVIEW by Breed, Horn, McKee, Smith, Knowler, and Stauffer.

Selection and Gradation of Words

The search for valid spelling words was continued in this period. The evaluation by Hildreth (13) of samples of words in the third and fourth thousand ranges of widely-known adult vocabulary lists and of words in two tabulations of vocabularies of spellers, one of them completed since 1940 (4), indicated that from 56 to 71 percent of these words fell beyond the most common 2800-2900 words in Rinsland's *A Basic Vocabulary of Elementary School Children*.

After reviewing vocabulary research, Fitzgerald (8) used results of important pertinent investigations of child letter writing, composition writing, and adult letter writing to compile a list of 2650 words for a basic life spelling vocabulary. He reported the frequency, credit, or occurrence of each word in the basic writing vocabularies of Horn, Rinsland, McKee, Breed, Dolch, Brittain, and Fitzgerald and presented data which indicated the high validity of the basic life vocabulary. Easily identified in this basic vocabulary are three smaller lists: (a) a permanently useful core of 449 words for beginners and the retarded, which with their repetitions account for more than 76 percent of running writing basic to the Rinsland list; (b) a second core of words highly useful in child and adult writing; and (c) a list of 473 common derivatives formed by adding "s," "d," "ed," or "ing" to base words of the list.

Word selection based on child needs was attempted by Hanson (11). Second-grade children selected words they needed in writing in a social studies unit centered on the home and studied them individually and in a

directed spelling period. A high overlap with basic vocabulary lists and better than average progress in spelling achievement was reported.

Betts (4) tabulated grade placement data on 8652 words found in eight well-known spelling sets published since 1939. He reported agreement on the grade placement of 65 of the 483 words common to the eight sets. Dickerson's report (6) of a study by Johnson showed variance in word selection and grade placement in 18 spelling sets quite comparable to that shown by Betts.

Increased consideration was evidenced among curriculum planners of city and state departments (20, 21, 22) concerning the selection of words, their grade placement, integration of spelling in the language arts, and methods of teaching spelling to meet the needs of children of varying abilities.

Spelling Errors and Difficulty

Because the persistency of misspelling of difficult words has been a problem for decades, the findings of Swenson and Caldwell (28) are interesting and important. In 680 letters which comprised 116,416 running words written by pupils in Grades IV to XII, they reported an almost continuous improvement in spelling of spontaneous writing from grade to grade. The percentage of spelling errors ranged from about 10 percent by children of Grades IV and V to less than 1 percent by pupils of Grades XI and XII. Of the 44 most frequently misspelled words, which accounted for 28 percent of the misspellings in these letters, 35 are included in the 222 spelling demons (8).

Fitzgerald (8) presented data on 222 demons in life letters by children of Grades III to VI and in school writing by children of Grade II. These 222 repeatedly misspelled words accounted for approximately 55 percent of the spelling errors and 61 percent of the 682,082 running words of the basic data. Every one of the 222 is in the Rinsland vocabulary, 219 in his most common 2000 words. The 100 words most misspelled in each grade and in the five grades were identified for curriculum builders. Additional evidence was supplied in Johnson's list (17) of difficult words tabulated from the creative writing of 14,643 children of Grades III to VIII in 199 school systems of the 48 states. Sixty-two of these 99 hard words (*it's* was listed twice) published were included in the 222 spelling demons.

Doyle (7) on the basis of scores made in Grades II thru VIII on two tests, one standardized in 1918 and the other at "the present time," concluded that children of the former period were better spellers than those of 1949. In appraising his findings, the comparative validity of the tests and the fact that the 1949 children of all grades scored higher on the average than the norms of either test should be considered. Ayer (2) tested 40,000 high-school pupils in 48 states and reported great variation in spelling proficiency in different high schools and among pupils of the same grade in school. He found a considerable falling-off of ability to spell in

recent years by pupils of Grade IX. Hageman and Laslett (10) reported that the mean number of words misspelled by 204 high-school pupils was 80 of the 320 presented in the *Sixteen Spelling Scales*. The spelling proficiency improved from the freshman to the senior year, and pupils with the higher IQ's spelled better than those with the lower IQ's.

Methods of Teaching Spelling

Wilson (31) traced the development of spelling from 1647 to 1840, from 1840 to 1900, and from 1900 to the present. The "alphabetical" methods of teaching spelling and reading in the first period and the "word" and "phonic" methods in the second period were described. Research results since 1900 supported the following conclusions: (a) spelling words should be presented in lists rather than in context; (b) spelling should be studied systematically; (c) the test-study method of teaching was found superior to the study-test method. Trends toward individualized teaching of spelling and to spelling integration into the whole elementary curriculum were reported.

In *The Teaching of Spelling* Fitzgerald (9) utilized research findings in presenting procedures for: (a) developing spelling curriculums (b) appraising materials, (c) planning programs for groups and individuals of varying abilities, (d) enriching learning, (e) organizing testing and re-viewing, (f) enhancing word power, (g) facilitating word usage, and (h) suggesting technics for diagnosis and remedial instruction.

Bandle (3) developed well-planned and well-motivated group cooperative test-study procedures of teaching spelling to 132 children in Grades III, IV, V, and VI, in which children who received perfect scores on Monday or Wednesday tests helped other children, one by one, to master their difficult words. Consistent improvement reported thruout the experiment was attributed principally to the pretest, correction of tests, and enthusiastic group cooperation. Stillberger (27) motivated 36 pupils in a sixth-grade class to study spelling cooperatively for a year. The children developed a spelling conscience, improved their spelling scores in final tests, and increased their efficiency in using words in writing by means of an effective test-study procedure, well-timed remedial work in spelling and handwriting, careful proofreading of written work, and vigorous activity in mastering difficult words.

Shubik (25) directed two groups of 81 third-grade children, matched in intelligence, achievement, and spelling ability, in studying 115 spelling demons in well-planned programs for seven weeks. Both groups concntrated on meaning, pronunciation, visualization, recall, test results, and writing words correctly. Each child of the test-study group studied the words he misspelled in the first and final tests of the week and in review tests two weeks later. The study-test group studied all words before testing and their hard words after final and review tests. Children of both groups used a five-step method of learning to spell new, review, and hard words.

Average learning gains by the test-study children were significantly superior to those of the study-test children.

Templin (29) matched 78 deaf pupils in Grades V to XII with 78 hard of hearing pupils and with the same number of normal hearing pupils in intelligence, sex, age, and grade placement. She found that the deaf made about one-half as many spelling errors as the hard of hearing and approximately one-third as many spelling mistakes as the normal pupils in writing explanations of common physical phenomena.

Nichols (23) constructed two forms of a test designed to discover specific spelling disabilities of children. She used one form of the test before teaching a remedial group for four months. She used the second form after teaching and reported that results on the five subtests—proofreading, word meaning, handwriting, visual discrimination, and auditory discrimination—reflected changes in spelling proficiency.

Kyte (19) grouped children in Grades III thru VI on results of spelling and intelligence tests and previous spelling records. Words were assigned on the bases of needs and of difficulties for the various ability groups. Regroupings were made after periods of from five to seven weeks on the basis of test results. Appraisal during the year-and-a-half period showed that spelling progress was affected adversely by low intelligence, prolonged absence due to illness, and emotional disturbances.

Spelling: A Facet of Language

Keyser (18) used a rotation technic to study the amount of incidental learning of spelling which occurred in four types of word presentation in reading. Eighty carefully selected words which had not been taught were embedded in eight well-written stories which were read by half of a group of 332 children in Grades IV and V; 80 carefully selected synonyms of these words were substituted for the original words in these stories and presented similarly to the other half of the children. Tests on the 160 words indicated that incidental spelling learnings of words presented in reading were highly significant statistically when the teaching was done thru word analysis or oral presentation with meanings explained, but were not significant when the words were presented in context only or when a glossary presentation was made.

By testing 7454 children, representative of the school population of Iowa, Sparrow (26) determined the coefficients of correlations between reading vocabulary and spelling to be .68, .68, .59, .60, .59, and .56 and between reading comprehension and spelling to be .66, .59, .51, .56, .57, and .54 respectively for Grades III to VIII. As probably contributing to the relationship, she reported the following factors: (a) general intelligence, (b) overlapping vocabularies, (c) understanding, (d) incidental learning, (e) word perception, (f) interest and effort, (g) phonetic content of words, and (h) ability to generalize. Interrelationships of the language arts were found also in the following study. Two hundred and fifty-nine

retarded pupils in Grades IV, V, and VI were tested by Hudson and Toler (15) before and after a four-month period of carefully planned teaching to increase auditory and visual discrimination patterns of words. Results indicated improvement in spelling efficiency far beyond that which could be attributed to ordinary incidental learning.

Handwriting

The article signed by West and Freeman (30) in the *Encyclopedia of Educational Research* suggested the need for further studies in problems of handwriting. Selected references in the October issues of *Elementary School Journal* were helpful in appraising the investigations carried on in handwriting.

Hildreth (12) surveyed 258 sources on hand dominance and presented many conclusions and recommendations helpful to teachers of handwriting on the characteristics of handedness, the developmental tendencies of handedness, origins of handedness and lateral dominance, developmental problems associated with handedness, and training of handedness. Ames (1) found by means of a cinemanalysis of the writing behavior of 179 children from 36 months to 10 years of age that the preferred place of writing moved quite consistently thruout the age levels from the bottom right, to the center, then to the top center, and finally to the top left of the paper.

Investigations of handwriting of adults suggest possibilities for study on other levels. Rollstin (24) found that the average quality of handwriting of 250 college freshmen was 45.32 and the range was from 20 to 90 on the *Ayres Scale*. The letters *r*, *n*, *e*, *a*, and *v* accounted for 48 percent of the illegibilities. The largest number of illegibilities in the capital letters was made in writing the letter *I*. Approximately 22 percent of 2423 small *a*'s analyzed were considered acceptable and 78 percent were judged to be more or less illegible.

The handwriting of 103 college students—from freshman to graduate rank—was studied by Irish (16) by means of an Interval Meter. Her results showed a lack of rhythmic pattern in handwriting. The individual differences in amount of time required for writing a letter of the alphabet were very great, but there was little difference in the amount of time taken to write various letters singly by individuals. Letters in combination and in sequence required a shorter time for writing than single letters. There seemed to be greater uniformity of rhythm in writing words than single letters.

A photographic method suitable for analyzing letter forms and strokes in handwriting was reported by Boraas (5). His analysis of the writing by 12 graduate students of the capitals *F*, *G*, and *T* indicated: (a) straight lines were written most rapidly and with little deterioration; (b) curved lines deteriorated into straight lines; (c) speed changes were the cause of

erratic writing; (d) simple forms of letters made in continuous free flowing lines were found to be preferable to complex forms which involved many pauses, sharp changes in directions, and air movements.

Summary

Research results in this three-year period on word selection, gradation, and spelling difficulty should be highly valuable in curriculum planning. Evidence from studies of method emphasized the importance of a well-planned program systematically carried out and the desirability of teaching spelling as an integral part of the language arts. It seems fair to surmise that if the research results of the last 30 years were properly applied in building curriculums and planning procedures, spelling mistakes would be reduced significantly and written communications enhanced greatly. Further investigations of problems in motivation, word selection, gradation, learning, mastery, and word usage are needed to perfect the teaching and learning of spelling.

Studies made in this period suggested a rebirth of interest in hand-writing. Careful investigation of the many problems of manuscript and cursive writing should be undertaken.

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CHAPTER IV

English Composition

M. AGNELLA GUNN and ELIZABETH R. BARLOW

THE most noteworthy summary of research findings in English composition published in the past three years is that of Greene (11). He stated that the major interests of research workers to date were the following: (a) studies of the values of formal grammar, (b) analysis of expressional products of high merit, (c) surveys of language usage at various school levels, (d) surveys of the frequency of usage of certain language skills, (e) computations of language errors, (f) analyses to discover the specifics of rhetoric instruction. He suggested the following fields of needed research: (a) identifying skills which are socially significant in oral and written expression, (b) establishing standards of practice in mechanics and usage, (c) developing criteria for grade placement, (d) organizing effective learning sequences, (e) determining learning difficulties of skills, (f) evaluating various teaching methods, (g) improving methods of evaluation and analysis, (h) preparing and evaluating instructional materials. A tabulation of Greene's references by decades might indicate a decrease in either the production or publication of significant research in composition during the past decade, since he includes only 13 references for 1940-1949, as compared with 32 for 1930-1939, and 33 for 1920-1929.

Other summaries of interest to research workers in composition were the annual selected references of Smith (27, 28), a summary of research concerning English usage by Dawson (4), and a research concerning interrelationships among the language arts by Artley (1).

Evaluation in Composition

Travers (32) reviewed the difficulties encountered in evaluating the results of teaching composition, warned against the limitations of both essay and objective tests, and suggested methods of evaluating esthetic expression and outcomes beyond the classroom. Evidence of the possibility of developing reliable marking of themes was provided by Wiseman (35), who reported a correlation of .946 between the aggregate of marks by four experienced persons and their aggregate marks on 200 papers four months later. Ebbitt and Diederich (8) found a correlation of .71 between instructors' judgments of the grades deserved by 422 college students and the students' scores on a six-hour examination in writing.

The opinions of high-school students about the comparative value of essay examinations and objective tests were reported by Bender and Davis (2). The 1040 students in 41 high schools believed that essay examinations would show their knowledge to best advantage and would cause them to study hardest; they would avoid essay examinations if they had

no opportunity to study for an examination. Merrell (23) found that high-school experience with essay tests appeared to aid college students' marks on essay tests.

The inventive aspects of children's compositions were studied by Sister Mary Francis Assisi (22). Three compositions from each of 502 children in seventh and eighth grades were analyzed for inventive qualities. The percentages of compositions falling in six classifications were as follows: ingenious, 6 percent; common, 56 percent; sensationalistic, 13 percent; fantastic, 3 percent; aimless, 13 percent; and noninventive, 8 percent. A preliminary study showed that each type was defined clearly enough so that the writer's judgment in each case agreed with the modal judgment of seven independent judges. An analysis by intelligence groups showed an almost identical distribution of all types of compositions, with a slightly higher percentage of "common" solutions among pupils of 120 IQ and upwards. Of the compositions rated as ingenious, 35 percent were by boys and 65 percent by girls. The two compositions in which starting situations were given yielded 6 percent and 2 percent of ingenious themes, as compared with 11 percent when pupils were allowed to choose their own topics.

Curriculum and Method

A questionnaire survey of the language needs of vocational students in 16 California high schools was conducted by Watts (33). An elaborate list of activities in speaking, writing, reading, listening, and "employing the enabling skills," was sent to 82 vocational and English teachers. These teachers judged the value of each activity for their students, making one of the following ratings: minimum essential for all, desirable for average success, associated with leadership, not important to persons finding employment in the field concerned. Ratings were tabulated for each activity and were divided by agriculture, industrial arts and mechanics, home-making, commerce, all vocations, and English teachers. Tables showed also the times each activity was employed per semester, and the judgment of the author on the most appropriate rating.

Teacher awareness of listening as a language arts activity was studied by Wilt (34), who submitted a questionnaire to teachers in regard to amount of time elementary-school children spent in reading, speaking, listening, and writing in an average school day. The teachers were asked also to rank the four skills in order of importance. The results from 1452 teachers in 42 states led the author to conclude that teachers are unaware of the importance of listening and that they do not teach listening as a fundamental skill of communication.

Lewis (19) showed that standards of correctness in English expression are still highly fluid. He sent to nine groups of educated adults a list of 19 sentences in which a controversial grammatical expression was underlined. An acceptance ratio was computed for each group, based upon the number of expressions considered acceptable by that group. The groups

listed in order from the most liberal to most conservative, were as follows: 19 college teachers of English; 33 authors; 12 lexicographers; 80 editors; 22 radio columnists; 32 high-school teachers of English; 60 readers of *Harper's Magazine* selected at random; 48 feature writers and columnists on Chicago and New York newspapers; 26 editors of women's magazines.

Geist (10) taught a special section of rhetoric for agronomy students in college, in which rhetoric assignments were tied closely to the content of agronomy classes. Altho student reaction to the course was excellent, the author concluded that there was little transfer to agronomy papers, and that the segregation of students was neither necessary nor beneficial.

Lokke and Wykoff (20) doubled the amount of theme writing for 20 college freshmen who wrote 30 to 34 themes a semester as compared with 16 themes a semester for a matched group of 20 freshmen. The two groups were matched for scores on tests of English and intelligence, college curriculum, and previous background of English courses. Double writing reduced failures 66 percent, and improved grades 60 percent.

In the belief that written language tends to inhibit thought of third-grade children, Oftedal (24) tried "picture writing" with 25 children. These children planned, organized, and recorded their stories on drawing paper folded into parts in order to tell the story as a sequence of events. The children then "read" their stories from their pictures. Two picture-written stories and two handwritten stories of each of 13 pupils were analyzed for various elements of expression. The picture-written stories were superior in number of ideas, number of new ideas, amount of original fantasy, adequacy of vocabulary, length of story, length of sentences, and reduction of projection of past experiences.

Status Studies

Lorge and Kruglov (21) correlated readability ratings of pupil's compositions with their measured intelligence. Using the Lorge Readability Formula, they rated the compositions of 50 students drawn from a random sample of eighth- and ninth-grade pupils applying for admission to a highly selective high school of science. They found a correlation of .14, from which they inferred that for this selected group there was no relationship between the structural elements of composition and measured intelligence.

Improvement in letter writing ability of rural children in ungraded one- and two-room schools was compared by Krietlow (17) with that of rural children in graded schools. Experimental and control groups were set up in the sixth grades of both types of schools. Seven hours of instruction in letter writing were given the experimental groups. A letter writing test with a reliability of .92 was used before and after the teaching. Analysis of variance showed significant differences favoring children in graded schools, children whose teacher had two or more years of training, children in accredited ungraded schools as compared with those in nonaccredited schools.

Vocabulary

The size and nature of children's vocabularies continued to interest investigators. Seegers and Seashore (26) and Rinsland (25) summarized research findings and discussed differences in technics of measuring vocabulary. Dolch (7) challenged the assumption that children's free writing is a dependable indicator of word knowledge. Thru specific measurement of children's knowledge of word meanings in four areas, (a) house and home, (b) clothing, (c) recreation, and (d) animals, using objects and pictures, Dolch found results different from those in the free writing studies. He concluded that a systematic testing procedure in specific areas of word knowledge is necessary for accurate measurement of children's vocabulary.

Using stenographic recording of children's oral description of pictures, Carlton (3) tabulated substantive modifiers of 66 pupils in fourth and fifth grades. The pupils were selected for normality of intelligence and socio-economic backgrounds. Of 25,805 words, 1637 were used to modify substantives. The limited number of modifiers available in children's speech was shown by the fact that only 105 different modifiers were used. Kaldegg (14) analyzed high degree abstracts among nouns of time in the writing of children in Grades III to VIII. Altho there was little variation in absolute number of time abstracts, the number of high degree abstracts increased markedly from grade to grade. Hughes and Cox (13) compared the oral language of 45 first-grade children with that found in preprimers and primers. They concluded that children's spoken language was superior to that of the books in variety of vocabulary, vitality, and sentence maturity.

Prediction of Success in College English

The *Cooperative English Placement Tests* were found by Knickerbocker (15) to predict success in freshman English better than did grades on themes written during the preregistration testing period. Fletcher and Hildreth (9) obtained a correlation of .48 between scores on the *Ohio State University English Placement Test* and instructor's ratings of students in English classes. Altho the *English Placement Test* had a correlation of .75 with the *Ohio State University Psychological Test*, the authors concluded that both tests should be given since student morale would be better if achievement in English rather than intelligence were used as a basis for English placement.

Krathwohl (16) computed an index of industriousness in English by comparing students' scores on English aptitude and English achievement tests. Students were divided into indolent, average, and industrious groups. Student achievement in English at the end of the sophomore year showed a positive relationship to the index of industriousness. Low aptitude and low industriousness made it impossible for a student to remain in college two years. In order to survive, a student needed to have favorable standing in either industriousness or aptitude.

Textbooks

The past three years saw the publication of many new professional books in teaching of language arts and English. Dawson (5), Strickland (30), and Tidyman and Butterfield (31) were authors of textbooks on the teaching of language arts in the elementary school. The teaching of English in secondary schools was the concern of books by De Boer, Kaulfers, and Miller (6), Hook (12), La Brant (18), and Stearns (29).

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CHAPTER V

Speech

FRANKLIN H. KNOWER

THIS three-year period encompasses the end of a decade and a mid-century year. It also includes a period when many research projects started in the years of postwar expansion of higher education were brought to completion. It was a fruitful period as revealed by the bibliographies and the many areas of emphasis. Areas of greatest activity include voice science and experimental phonetics, group analysis of speech phenomena, discussion, listening, teaching materials, communication theory, and professional educational problems. No attempt is made in this review to cover the work in speech and hearing disorders as this material is covered in the issue on special education. Three new journals were started during this period and others, particularly the regional journals, greatly expanded.

Bibliographies

Auer (2) reported 231 doctoral dissertations in progress as of 1950. The index to completed graduate theses in speech has been continued by Knower (76) thru Number 18 in his series. There were approximately 1000 graduate degrees in speech granted by American colleges and universities in 1950. The number reported for 1948 was 546. Dow's (33) abstracts provide a more detailed exposition of the content of many of these pieces of graduate research. Haberman's (48, 49, 50) annual bibliography on rhetoric and public address was shifted from the *Quarterly Journal of Speech* to *Speech Monographs* during the period. It provides a systematic annual review of major works appearing in the field. The 10-year bibliography by McDowell and McGaw (91) is the most systematic guide to the theater work of American colleges and universities which has appeared.

Other bibliographies of interest include a 10-year supplement to a previous work by Thonssen, Robb, and Thonssen (120). This bibliography is a useful companion to the major bibliography prepared by the senior author 10 years ago. Knower (79) prepared an index to the major articles in the *Quarterly Journal of Speech* and *Speech Monographs*, and Shepherd (107) used the same classification system in indexing the articles which have appeared in *Western Speech*. Another bibliography by Knower (77) provides a systematic guide to other source bibliographies which are of interest to students of speech.

Voice Science and Phonetics

The study by Black (8) showed that environmental noise affects the vocal intensity of the speaker. Hanley and Steer (54) reported that dis-

tracting noises produced slower rate, prolongation of syllables, and increase in intensity of voice. Black (10, 11, 12, 14) also revealed that the intensity of heard tones has an effect on the intensity of produced tones, that speakers tend to copy the inflection they hear, and a speaker's vocal responses appear more as a reflection of loudness than fundamental pitch. Another study by Black (13) indicated vocal responses are varied in different message types. One of the first studies carried out in the field by Black (9) on the existing phenomenon of the effect of delayed side tone on speech shows that it affects both the rate and intensity of the speaker.

Kelly and Steer (74) indicated that the practice of reporting rate in terms of average number of words per unit of time needs revision to include deviations in rate. The report on average rate did not reveal variations of from 125 to 328 words per minute. Snidecor (112) reported that most pitch changes occur within one and one-half tones. Women's voices vary less than men's; and superior readers read somewhat slower than the average student. Villarreal (122) found individual judgments of vocal quality showed extensive variability altho group judgments have considerable reliability. He concluded that we need devices that will give us more objective evaluations of voice. One such device was reported by Dempsey and others (29) to be a speech meter which produces a direct reading fundamental frequency analyzer.

The phenomenon of intelligibility has been the focus of a number of studies. This standard enables the teacher to get away from personal taste as a basis for speech evaluation. Dayne and Steer (28) described an intelligibility test which appears to differentiate persons of normal and defective hearing. Draeger's (34) study revealed that intelligibility is apparently related to vocal intensity and syllable duration. Kelly and Steer (73) found that reduction from 10 to 20 decibels of previously recommended levels of voice did not greatly reduce intelligibility of speech. Siegenthaler (109) revealed that certain vowels are more intelligible to experts than to nonexperts. Both Curry (26) and Black (12) also investigated vowel intelligibility and reported vowels of equal intensity are not equally well identified. The vowels identified best at lowest intensity levels were the [ɪ] and the [ə]

Tolhurst (121) found the thresholds for voiceless consonants are at very low intensity levels, and that the audibility of sounds is related to their position in the syllable. Black (12) showed that the more open the vowel the lower its frequency and the greater its duration. The work of Fairbanks (37) indicated that the diameter of the oral channel is correlated with the intensity of the vowels. Hanley (53) studied intonation differences in the three major American dialect regions and found greater duration of some sounds in both eastern and southern speech than in general American speech. The study by Wise (129) provides us with a detailed comparison of Russian and English sounds. O'Neill (96) could find no speech reception skills of normal hearing persons related to lip-reading.

Personality of the Speaker

Several studies show significant relationships of the personality of a speaker and his speech. Henrikson (61) reported correlations of ratings on personality; vocal rate, quality, and pitch; and teaching effectiveness of college teachers. Important implications for counseling students interested in dramatics were revealed by Drake (35). He found the Allport-Vernon test of values, the *Minnesota Personality Scale*, and the *Minnesota Multiphasic Personality Inventory* useful instruments. Background information also proved helpful. Acting interests were correlated with scores on feminism, hysteria, hypochondriasis, and social extroversion. Kryter (81) did an extensive study of the effects of many aspects of noise on the speaker.

Five of these studies dealt with stage fright, one of the most persistent personality problems of the speaker. Low and Sheets (87) showed stage-fright to be related to lack of experience, poor social adjustment, narrow interests, and weakness in linguistic ability altho it was not related to intelligence, ability to reason, or some types of interest. A correlation of .59 between self-ratings and rating of others was revealed by Dickens, Gibson, and Prall (30). They also indicated speakers feel more nervous than they appear. In another study by Dickens and Parker (32) stage fright was shown frequently to increase blood pressure and pulse rate. Men and women apparently do not reveal their nervousness in the same way. Paulson's study (97) was concerned with the possible transfer of effects of learning to control nervousness in speaking. It indicated positive transfer for those with better social adjustment. Smith and Zawadshi (110) reported the successful use of hypnosis in relieving stage fright behavior.

Language

Johnson, Johnson, and Mark (69) did an analysis of the problem of verbal fluency and found it related to vocabulary size. Persons with the larger supply of words deplete them less rapidly. Hearers were shown by Herman (63) to respond differently as language stimuli are varied. Farr, Jenkins, and Paterson (38) demonstrated that the number of one-syllable words correlates highly with Flesch formula scores on reading matter. Swain (117) has data to show that 80 percent of a student group made more gain in a one-semester course of public speaking than in three quarter-courses in freshman English. Thirty percent made more gain in punctuation and sentence structure. Foley (41) reported conflicting findings on these points.

Children's Speech

Irwin (67, 68) continues to make significant contributions to our knowledge of infant speech. He shows sound types and phoneme frequency to differ in children of different family occupations and age groups. In

another study (66) consonants in initial positions are shown to develop in a linear rate; in a medial position they develop in a decelerating rate, and in a final position they develop in an accelerating rate. With Spiker (113) he reported low correlations between Kuhlmann test scores and certain aspects of speech development. This is consistent with data on homogeneous intellectual groups at later stages of development. Spriestersbach and Buck (114) revealed the use of speech as an index of growth and maturity. Lundeen (88) found diadochokinetic rate in children varied for different sounds in a manner similar to the order of sound development.

In a survey of speech delivery in Grade I children, Hahn (51) reported only about 48 percent with good speech. Brieland (18) found blind children had greater pitch modulation, good variety, and loudness. They had less bodily action and lip movement than sighted children. Anderson (1) and Heisler (60) revealed some of the behavior characteristics of children in an audience.

Speech and Thought

Research on the relationships of the higher mental processes to speech received little attention during this period. The work of Brown (19) showed that students had a more negative reaction to emotional than to irrelevant thinking. A test was devised which differentiated the thinking of college freshmen and graduate students. Brembeck (17) found that altho argumentation students gained more skill in critical thinking during a course than did a control group, the argumentation students had better original scores. Men subjects were more critical than women.

The Audience

In a study which bears on the influence of organization or arrangement in speaking, Cromwell (25) found that the best order for a weak and a strong argument in a series was to place the strong argument last. This may be interpreted as supporting climax order. Most of the studies of this problem done during the last few years have supported the anti-climax order. He reported further that ratings of speeches by listeners did not agree with their apparent effect on attitude scale changes. Smith (111) revealed that altho a randomized order of points was less effective in changing attitudes, the rearrangement of the order of points made little difference. Listeners thought the well organized speech would be most effective. Haiman's (52) data indicated that announcements of the prestige of a speaker influences the amount of attitude change in the audience. They also showed that speech had more effect with those in favor of the proposition and with women than their opposites. Moreover, original opinions influenced judgments about the speaker.

Working with measures of audience comprehension of instruction from

sound films, Nelson (93) revealed that altho learning occurred from both hearing and seeing, listeners learned more from what they saw. Maier and Solem (92) found that audiences learned more when they participated as role-players in problem situations than they did from mere presentation of facts and figures. The principle that a speaker should adapt his speech to his audience is supported by Grace (45) who studied the effects of different degrees of knowledge about an audience on the content of communication.

Heisler (60) made an extensive analysis of the difference between children who listen to radio and television a great deal and those who do not, for possible harmful effects, but found no statistically significant differences. Much of the work of Stauffer and associates (115) has significance for the methodology of those who work on audience research.

Group Influence on Speech

There has been a tremendous increase in interest in the influences of the group on communication processes. Most of these studies deal with speech. In a study of status Kelley (72) found persons of high status level are not critical of themselves or of their work in the presence of persons of lower status. A group of high cohesiveness was shown by Back (3) to make greater effort to reach agreement than groups of low cohesiveness. These results are supported by the findings of Horowitz and others (64). Leavitt (82) reported a relationship between the roles played by members of a group, their behavior, and their communication patterns. Festinger and his colleagues (39) reported one of the most extensive series of studies on problems of this type. In general they revealed speech to be influenced by pressures toward some conformity, movement goals with the group, and by the emotional states of its members. Guetzkow (47) edited a book which tells us of many of the studies sponsored in this area by the Office of Naval Research.

The work on the personal interview reveals another type of speech pattern given extensive analysis. Robinson (102) showed that speech in the interview is related to the topic discussed and the attitude toward it of the one being interviewed. Seeman (103) analyzed interviewers' methods and the evaluation of them. There was general agreement on the categories used to classify the interviewers; counselors were shown to be relatively self-consistent in their methods, but not consistent with others in the group studied. Sherriffs (108) revealed that instructor's interviews with students in large classes seemed to be correlated with better student work in the courses. Davis and Robinson's (27) study of methods of overcoming resistance to counseling show the process to be difficult. Fields (40) reported a group interview technic used as a test with favorable results.

The study of conversation by Phillips (99) indicated that poor conversationalists are seldom aware of their problems, that the topic and the situation do much to influence the quality of conversations, and that good

conversationalists score better on a number of aptitude and personality tests than do poor conversationalists. Bradford and Corey (16) show how large groups can be organized to participate and to gain more from meetings than they will gain without active participation.

Discussion

Much of the work reviewed under the previous heading might have been included here. There is a growing interest in the evaluation of discussion techniques. Hardee and Bernauer (55) used a checklist to facilitate the process of evaluation. Bass (4) described the operation of leaderless group discussion and showed that the emergence of leaders in this type of activity is related to the amount of talking done. In another study Bass (5) compared the reliability of judgments of job candidates in leaderless group discussion and interviews and found no significant differences. Factors common to the ratings include "voice, manner and bearing, physical appearance, and speech." This point may illustrate the findings of Dickens and Heffernan (31) who contend that many of these studies set up by psychologists show a lack of the realistic understanding of the nature of speech and discussion shown in studies set up by students of speech.

Reading—Oral and Silent

McCoard and LeCount (89) found that extremes of skill in silent reading are revealed in the evaluation of oral readers. Jones (71) indicated that speech training improved silent reading achievement of Grade III children, altho boys did not improve as much as girls. In a study of physical action in simulated expression of emotions by oral readers Strother (116) reported that some emotions were characterized by a higher level of action than others and that readers who best simulated the emotions showed more widespread action. Practice heightened the use of such action.

Speech in Industry

A report by Pigors (100) showed the best possible extent of the use of speech in industrial relations. Peters (98) did a major piece of research on the use of communication in the Esso Standard Oil Company, and recommended that a continuing study of this problem include evaluation of communication media, application of human relation skills, opinion surveys, counseling services, training editors, better use of letters, mass media, manuals, cooperative committees, use of research facilities of colleges and universities, and better organization of communication policies. Knower (78) did a pilot study in this area and found management interested in improved communication for executives and supervisors but with little interest in improved communication for workers. The communication problems of men in business were found to be similar to communication

problems of men in other kinds of work. In a survey by Zelko (130) it was shown that about three-fourths of 322 major business concerns considered communication skills sufficiently important to give their supervisors and executives some training in them.

Listening

Studies in listening are of two types: one approach has been developed by the communication people in general education, and the other has been followed by those interested in mass media. Blewett (15) reported such findings as these: (a) There are considerable individual differences in listening skill. (b) Scholastic aptitude and general intelligence have only moderate correlations with listening. (c) Listening skill cannot be predicted from measures of reading and vice versa. (d) Listening is not closely related to hearing acuity. (e) Listening is a fruitful method of learning. Kramer and Lewis (80) revealed that those who both see and hear a discussion get much more than those who hear only. Black's work (8) shows that the efficiency of listening is influenced by the presence of noise. There appeared to be little improvement in listening as the result of training in reading according to Johnson (70) altho training in listening produced statistically significant improvement in listening. Heilman (59) supports these results on measured improvement, and found that this training has transfer value to new and different situations. The training was most beneficial for low aptitude students. Brown (20) reported a new type listening examination which is as effective as written examinations and gives the listener an equal chance with the reader to demonstrate his knowledge.

Swanson and Jones (118) concluded that television viewers listened less to radio and read less than others. They tended to know less about current government affairs. Carlson (22) found that guides to reading could be used to improve radio listening. Dunn (36), Levi (85), and Tallman (119) also reported success in improving the radio listening habits of students. Chall and Dial (24) used readability formulas to show that they could predict listening difficulty and interest. Some features of newscasts which affect listeners were shown by Harrell, Brown, and Schramm (57) to be: preference of newscasts of 20 to 30 items rather than 45, human interest, index words, dramatic events, and nearby events. Details including names are not well remembered.

Extracurriculum Activities

That college debate is not an activity restricted to a few is shown by Nelson and Fest (94) in their report indicating the average number of participants per school to be about 30, with the average number of learning experiences per student to be about 27.50. Carmack (23) found the average debate budget to be in the neighborhood of \$1000.

Williams (127) and Hatten (58) surveyed college and university theater productions. One hundred and twenty-six schools reported 403 productions with 1446 performances which played to over 1,200,000 spectators. The educational theater appears to be mass communication. Gee and Dietrick (44) showed that in one year more than 10,000 students participated in and over 200,000 spectators viewed high-school plays in Wisconsin. Bavelly (6) found that what high-school students prized most from their work in dramatics was improvement in fundamental speech skills rather than preparation for professional work or recreational activity. The research on speech activities by the North Central Association (95) lead them to conclude that well-directed educational programs of speech activities are fundamentally sound.

Teaching Material

Two reports by LeBel (83, 84) provide an excellent review of principles to follow in purchasing and caring for recording equipment. Henrikson and Irwin (62) show variable uses of recording equipment and report need for more study to properly evaluate its uses. Voorhees and Foster (123) provided an extensive list of recordings he found useful in teaching theater. In two reports Foster and associates (42, 43) do a similar job for film strips, film slides, and 16mm films. The persistent problem of play selection was investigated by Seibert and Sheets (104) and by Sheets (106) who reported on the plays considered most usable by a large number of directors.

Professional Problems

The typical college curriculum for the general speech major was studied by Hargis (56) who found the average semester credit hours for theater to be 6.7; public address, 6.1; speech science, 3.5; interpretation, 3.5; radio, 3.4; and fundamentals including voice and diction, 6.3. In radio, Williams (128) reported little uniformity in course patterns but that most schools require a considerable amount of work in practical radio broadcasting. West (124) found that only about 60 percent of our colleges give theater directors credit on teaching load for time spent on theater productions. When credit was allowed, he claims it was not enough to prevent theater directors from carrying an unduly heavy work load. The study by Knowler (78) analyzes the speech program of an entire state from kindergarten thru the graduate school and in programs of adult education. It made use of documentary evidence, questionnaires and interviews to secure the data on which to evaluate the soundness of the program. While the work in Ohio is seen to compare favorably with programs elsewhere, many areas are in need of improvement.

Byers (21) reviewed the attempt to predict teaching success, and reported speech is shown in many of them to be an important factor. The work of

Huckleberry (65) indicated that improvement in speech is correlated with improvement in the success of practice teachers. Lillywhite, Phelps, and Basye (86) found that altho teachers report recognition of need for speech skill, there is no consistent pattern of speech instruction in teacher-training institutions.

In a study of degrees awarded to speech majors Knower (75) revealed that among 60 special area majors studied for 1947 and 1948, speech bachelor's degrees ranked twenty-fifth and twenty-eighth from the top, speech master's degrees ranked twenty-second and twenty-third from the top, speech doctorates ranked twenty-third and twenty-fifth from the top. The area of the country with the strongest speech program is the Midwest. The West has relatively strong speech programs, whereas the East is generally backward in speech education. Gray's (46) study of the history of speech education reported what has been done and suggests other problems to be studied.

Communication Theories

This report should not be concluded without some reference to the variety of communication theories in which there appears to be a growing interest. One of these theories stems from work in general education. Some claim that best educational results will be derived from integration of all work in this area. In a study by McCrery (90) correlations between speaking and writing achievement are found to be low. He reported that "performance in one area provides almost no basis for predicting performance in others." Riley, Riley, and Lifshitz (101) from a background of interest in sociology and public opinion analysis outline a research program growing out of their studies.

The theory that has probably attracted the most attention is sometimes called the Mathematical Theory of Communication. Wiener's two books, (125, 126) are basic expositions of this point of view. Another is the book by Shannon and Weaver (105). Belzer (7) reported on the actual use of some of this theory in the work of the Bell Telephone Company. Before the significance of some of these theories for education can be soundly evaluated, they need to be translated into principles applicable to everyday communication activity. There might be considerable value in having the proponents of various theories of communication make a greater effort to communicate with each other, and particularly to make the acquaintance of the work of other scholars on their problems. Until this is done, much unnecessary confusion will continue to prevail in this important area of scholarship.

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CHAPTER VI

Instruction in Foreign Languages

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BECAUSE there was no review of foreign language instruction in the April 1949 issue of the *REVIEW OF EDUCATIONAL RESEARCH*, this summary covers a six-year period dating from approximately January 1946. While a large number of contributions to the literature of this field were published during the period, comparatively few of them can be thought of as representing educational research studies. This review desires to focus attention on the experimental studies, but it has been found necessary to refer extensively to writings which suggest new orientations and methods in language teaching, many of which might well be subjected to experimental evaluation.

As the result of various factors, the field of language teaching has been in considerable ferment during the past six years. The objectives, methods, and procedures used in various government-sponsored language-training programs during World War II have had a profound effect, not only because they brought out into the open much latent dissatisfaction with the previous emphasis on the reading aim but also because in many respects they suggested ways in which academic programs could be usefully revamped. Foreign language methodology seems to have been revitalized in these four ways: (a) aural-oral aims and methods are given much attention, even when reading is the primary goal of instruction; (b) audio-visual equipment is being extensively used to help achieve these goals; (c) intensive and semi-intensive courses are receiving wide experimentation; (d) descriptive linguistic analysis is being brought to bear on the preparation of teaching materials. As a result of the last of these trends, it is claimed that a sounder approach to phonetics and grammar has been made possible. For example, grammar is to be taught functionally rather than normatively. These trends have resulted essentially from an inner conviction that the proper study of language must begin with its spoken, living form rather than its written form. This changed orientation has perhaps been the chief contribution of the linguistic scientists, who on theoretical grounds drew attention to the importance of aural-oral objectives and on practical grounds demonstrated that such objectives could be attained about as well as the reading objective. Thus, the star of the Coleman report (36), which emphasized the reading objective, no longer remains so clearly in the ascendent. At the same time, we find no little ambiguity in the few experimental studies which have attempted to evaluate the relative effectiveness of traditional methods as compared with methods now being emphasized.

It is necessary to comment on the use of the appellation "ASTP" used so often by authors cited in the remainder of this review. While it is true that the intensive language-training methods advocated by linguistic scien-

tists came into greatest prominence in connection with the language courses of the Army Specialized Training Program, this connection was purely circumstantial; what are frequently called ASTP methods were not originated in the ASTP nor were they peculiar to that program. The initial directives regarding the ASTP methods originated from the intensive language program of the American Council of Learned Societies, and were based on the thinking of a number of linguistic scientists who had previous experience with the teaching of a variety of unusual languages. Agard and Dunkel (3), however, have pointed out that these directives allowed considerable latitude; the methods actually employed in the ASTP were sometimes a far cry from what had been intended. Therefore, the designation of a method as an ASTP method can only mean that the method is in some more or less vague sense a variation of a *direct*, intensive method emphasizing the aim of speaking and understanding a second language.

Bibliographies, Reviews, and Reference Works

During the period covered, the most significant bibliographical contribution was the publication of the third volume of Coleman and others' analytical bibliography (37), covering the years 1937-1942. Plans for continuing this work beyond 1942 have not yet materialized. Tharp and others (133) contributed an annotated bibliography of modern language methodology for the year 1949. Brickman (23, 24) covered the years 1942-1949 in his reviews; in our judgment, however, some of Brickman's comments may give rise to erroneous interpretations of the literature he covered. Newmark (98) published a useful compilation of significant articles and extracts covering many phases of the field, ranging from 1900 to about 1946. An excellent bibliography appeared in Dunkel's book (47) on second-language learning. Brown and Russell (26) made available a bibliography on the teaching of English as a foreign language. Bull (27) discussed the theory and practice of Spanish word counts, and Brown and Shane (25) prepared a Brazilian Portuguese idiom list.

General Discussions of Trends and Objectives

As evidence of the contemporary trend toward an emphasis on the oral-aural approach, we need only cite a few general discussions. In a short and witty article, Bovée (19) took a quick glance backward and reviewed the grammar-translation methods of the nineteenth century, the "direct method" of the early twentieth century (the direct principle, he said, meant "the establishing of a direct relation between the thought and the foreign word"), the "thoroughly discredited" Coleman report published in 1929, and the ASTP methods which "have exerted a profound effect on the teaching of the modern foreign languages." He cited a number of universities which are using the "modified Army technique, i.e., the aural approach." Finally, he mentioned his own experiments, which appeared to

show that foreign language materials are much better retained if oral practice is emphasized. Schreiber (125), Delano (42), and Alexander (6) wrote enthusiastically about the possibilities of the oral approach. It is significant, also, that even those like Pargment (102) or Phillips (106) who were less sanguine as to the feasibility of the oral approach were nevertheless willing to urge as much attention to the oral objective as possible. Pargment cautioned that language learning by any method is difficult.

Kaulfers (76) pointed out that foreign language methodology is probably more thoroly documented than any other field of education. He advocated that before any change is made in a curriculum, the teacher should take it as an obligation to study the literature of educational research, which he attempted to summarize briefly. He concluded that research on vocabulary learning shows no significant superiority of any one method over another, but that every method must be judged as to its total contribution to language skill. Likewise, there is no "best" method in teaching reading, but silent reading ability should be encouraged early if a life-long interest in reading is the objective. Kaulfers agreed with many others who have found that training in formal grammar is of little use, and deplored the uncritical use of language word lists. He summarized the Agard-Dunkel investigation (3) with the remark that its findings "confirm conclusions long accepted as valid principles in educational psychology," namely: we learn what we do (i.e., possibilities of transfer from one skill to another are minimal), the direct route is the shortest (e.g., superimposed systems like formalized phonetics are distractions), every method has a point of diminishing returns, and individual differences are indestructible. Despite his acceptance of the last of these points, Kaulfers scorned the attempt to measure language aptitude on the ground that "to say that a person has no language talent is almost the same as saying that he has no capacity for being a human being." Similar iconoclastic conclusions were drawn on such topics as transfer of training, languages in childhood education, and bilingualism. While Kaulfer's remarks reflected a healthy skepticism, one may feel that he was unduly pessimistic as to the possibilities of further research on language methodology.

The Psychology of Language Learning

For the period in question, the most significant publication related to the psychology of language learning was Dunkel's comprehensive survey (47), completed as part of the Investigation of Second-Language Teaching sponsored by the Rockefeller Foundation. Stressing general theory rather than classroom practice, Dunkel began by considering in a systematic way the fundamental processes in learning to speak and understand a language, bringing in experimental evidence wherever it was available. He then considered various factors in second-language learning: age; intelligence and background; previous linguistic skills, habits, and experience; motivation;

the type of command sought; the teacher; and the materials. Throughout, considerable attention was given to the implications of linguistic science and to a wide variety of psychological experiments in learning, memory, etc. He concluded, however, that despite the significant amount of progress which has been made, "we need to know a great deal more about many important aspects of language learning." Dunkel's volume is a rich source of information and ideas concerning language learning and must take first place on the reading list of any serious student in this field. It contains several valuable appendices: (a) a description of carefully constructed learning materials (using Persian) which could be used in experimental investigations, (b) a report of the resolutions adopted by a Chicago Language Conference held in 1948, and (c) a 290-item bibliography. Unfortunately, the book lacks an index.

There have been two other pleas for the development of a more adequate psychology of language learning. Tyler (136) summarized some of the more urgent questions, and Carroll (30) pointed out certain principles from educational psychology which need to be emphasized in planning language training programs, particularly those emphasizing the oral-aural approach.

Kawczynski (77) suggested that language learners under the oral-aural approach fall into two general types: (a) those who are more interested in the grammar and structure of the language to be learned, and (b) those of a more extroverted temperament who are mainly interested in glibness. Eoff and Bull (52) advocated a "semantic approach" to the teaching of foreign languages. Their approach involved "going from the known to the unknown" by explaining English words before introducing the foreign word. They also felt it important to equate concepts rather than words, and called for a frequency list of concepts to help in this phase of instruction. After arguing that the results of the Agard-Dunkel investigation (3) compel a renewed emphasis on the reading aim in contrast to the oral-aural aim, Bernard (10) sought to present the psychological principles involved in the most efficient learning of foreign language vocabulary in reading. According to this writer the greater part of vocabulary learning, even in the native language, is by an indirect route, i.e., thru context. Hence, Bernard suggested, a foreign language text containing frequent interlinear translations will gradually build up the desired associations, and will save the drudgery of resorting to a glossary. Buxbaum (28), in a psycho-analytically oriented discussion, theorized that the ability to learn to enunciate foreign languages may be dependent on unconscious controls residing in the superego.

Interest continued in the question of whether study of a given foreign language shows any transfer to another language. Rosebaum (121) reviewed the literature on this question and concluded there is some evidence of positive transfer, that the amount of transfer is a function of time spent, and that most transfer takes place in connection with vocabulary acquisition. Several publications of Kettelkamp (78, 79) are based on extensive

experimental studies. In the first of these, some results favoring transfer were reported, but in the later publication Kettelkamp gave the impression that there was really little support for the claim that one language (e.g., Latin) should be studied as a preparation for the study of another language. This study involved the examination of results obtained when high-school pupils study several languages in various sequences.

Wittenborn and others (143) investigated the study habits of modern language students in college. Certain kinds of study habits, as reported on a questionnaire, were predictive of course-grades even when intelligence was held constant.

Leopold (85) reviewed the study of child language and bilingualism and pointed out that these fields have been pursued much more by psychologists than by linguistic scientists. Tireman's book (134) on teaching Spanish-speaking children is also pertinent to the problem of bilingualism. Smith (129) studied the vocabularies of bilingual children and found that their combined bilingual vocabularies (as measured by a standard test) were somewhat smaller than those of comparable monolingual children. She recommended on the basis of these results that a second language should not be begun until after the child has begun school.

It will have been noted that few experimental or observational studies have been cited in this section, most of the publications having been reviews or theoretical articles unsupported by any controlled data. Interest in the psychology of language learning thus seems to have waned during the period covered in this review. It has not been thought appropriate to review studies in the experimental psychology of verbal learning, since they have only an indirect bearing on practical problems of classroom procedures. An account of achievements in this field is to be found in the review by Hovland (72); Wolffe's review (144) of the psychology of training is also valuable.

Methods—General

The majority of reports analyzed in the following sections on methods reflect the return to a more direct method of teaching foreign languages.

American textbooks on language methodology included Kaulfer's *Modern Spanish Teaching* (75). The renaissance of the direct method is seen, in England, in the recent publications of Duff (45), Ball (9), and Stott (130). Duff believed that grammar should be studied with a linguistic approach, and that vocabulary should be learned directly, without translation into English whenever possible. In the final section of his book, he compiled a list of "absolutely essential" beginning words for all languages.

The essence of what may be termed the linguistic approach is the application of linguistic science to (a) the interpretation of educational objectives, and (b) the analysis of the language system to be taught. The "linguistic approach" may also involve certain instructional features such as native informants and drill sections, but these merely reflect the pedagogical biases of some linguistic scientists. Hall (64) gave a popular

presentation of linguistic science and its implications for language learning. The Linguistic Society of America has continued to publish analyses of particular languages, such as Hall's study of French (63). Among the textbooks representing the use of the "linguistic approach" are those of the Spoken Language Series (e.g. 135), accompanied by phonograph records. Pedagogical problems were discussed at Georgetown University's Round Table on Linguistics and Language Teaching (41). Fries (55), who has long been active in the teaching of English to foreigners, expounded his belief that methods and materials should be specially designed to take account of the similarities and differences between English and the native language of the learner.

According to Politzer (108), first-year language should be made a subject instead of a skill and should include the elements of linguistic science. His second-year course would contain an outline of the literary history of the language. In a second report (109) he proposed four ways in which students could become interested in language as such: (a) they should be taught something about the language, and (b) the psychology of language learning should be explained to them, as well as etymology and the grammatical structures of radically different languages. Bolinger (17) believed that much of our difficulty in language teaching is due to poorly trained first-year teachers and inadequate texts. Väänänen (138) agreed with this idea, suggesting that all language teachers should keep pace with their science, linguistics.

Comprehensive surveys of ASTP methods have been published by Agard and others (4), Angiolillo (8), Lind (87), and Matthew (90). Angiolillo discussed the origins, development, and methods of the government-sponsored language programs; his evaluations and interpretations are of particular interest. Lind pointed out some practical and technical difficulties in transferring ASTP methods to civilian education, altho she was in favor of semi-intensive courses, where possible, to achieve all aspects of the traditional five-fold objective (i.e., including the cultural aim). Shorter résumés may be found in Aggeler's appraisal (5), Harris's (67) interpretation of the intensive methods, and Reid's (114) study of the civilian use of drillmasters. A practical application of these methods in a specific civilian situation was described in the reports of Agard (2) and Cowan (39) on the Cornell Plan. A faculty committee (95) assigned to evaluate this plan concluded that despite certain disadvantages it had been a success and recommended its continuance.

The many references on foreign language methodology cited below have been arranged by specific languages, if only to provide a convenient division of the material. It should be recognized, however, that there are probably few methods applying to a particular language which would not also apply to the teaching of any other language. We shall start with publications based mostly on suggestions, interpretations, and uncontrolled observations of the "before and after" variety. Frankly experimental studies are reviewed under separate headings.

Methods—German

Koenig (80) reported on the use of a field trip to German districts as a good device for motivation and oral-aural practice. Scholz (124) believed that a direct method with functional grammar produces the best results. He noted also that more oral-aural practice can be obtained by splitting the class into groups of two or three students. The difficulties of teaching complex German sentences were examined by Boeninger (16) and Schmidt (123). Boeninger's students converted sentences taken from a complex German selection into simpler forms, and, by restricting them to certain types of sentences, he claimed to teach grammar functionally. Schmidt suggested the use of symbols for various sentence elements. The *raison d'être* for languages is, according to Shears (126), to impart information, and he declared that much caution should be used in drilling on unnatural bits of isolated language. He preferred not to mutilate reading selections for drill. Methods for teaching scientific German were described by Radmersky (110) and by Pauck (103), who recommended the use of common texts in the beginning phases and in later phases when students are grouped by major interests, the use of texts consonant with these interests.

Probably the most comprehensive discussion of the use of the intensive methods in German was "A Symposium on Intensive Courses for Civilians" (60). This study described what various universities have accomplished by adopting variations of the ASTP technics for the teaching of civilians. Jordan (74) preferred this approach for the first two years. Metcalf (93) described a 12-week intensive summer course with emphasis on reading but with optional oral-aural practice. Other universities have adopted full year intensive or semi-intensive courses. Fehlau (53) outlined an intensive course with much oral-aural emphasis covering two years in one. Another first-year intensive course with two hours a week of linguistic explanation and six hours of oral-aural drill was discussed by Bosshard (18). Funke (57), Goedsche (62), and Shelton (128) developed reading and oral-aural goals in semi-intensive courses of five to seven hours a week the first year. Shelton reported that with little practice in writing students did as well as those trained traditionally. Two more intensive courses were described by Peisel (105), who recommended a 10-hour-per-week ASTP approach, and by Nordsieck (100), who favored a 15-hour-per-week course including some oral-aural practice but with a traditional approach. Both Peisel (105) and Nordmeyer and White (99) indicated that linguistic ability should be made a prerequisite in intensive courses with emphasis on speaking and understanding since slow students hamper everyone else. Still other experimental courses were discussed by Ulmer (137) and Hite (70), the latter advocating the use of language "houses" to further speaking aims.

Many opinions were voiced as to the relative merits of the oral-aural and the traditional methods. Kurath (81), for example, believed that oral-aural methods achieve all aims better than any other. Striedieck (131) disagreed with him, suggesting that the favorable results stem from the intensiveness of the work rather than from the method used.

Methods—French

Of the various methods of teaching French analyzed, the oral-aural approach predominated, as with German, even when the reading goal was the primary aim. Delattre (44) believed that if the average class were taught only one-half the time by the speaking approach the pupils would read and write as well as under the traditional approach. In his opinion the newer methods are superior in all ways, particularly in motivating the students. He emphasized that spoken language should be taught before written language: that sounds should be associated with meanings before the student reads; pronunciation habits should be established before the student writes; and grammatical habits should be formed before rules of grammar are introduced. White (139), DeCannière (40), Richards and his associates (69, 115, 116, 117), and Harris (68) agreed that formal grammar should be de-emphasized and that the proper method should stress participation, particularly in speaking and understanding the language.

At lower than college levels excellent results with the conversational technics have been obtained in high school by LeVois (86) and in Grades V and VI by Machan and Messimore (88). Cheney (32) suggested that where constraints are placed on foreign language courses by state regent and college entrance requirements, an alternative "practical" course emphasizing speaking and understanding can be instituted, with graduation credit, for students desiring this emphasis. Bodier (15) believed that a special course should be instituted with the primary aim of improving the student's ability to *understand*.

Emphasis in various reports was placed on the importance of active "doing" in learning a language. Myron (97) described a method whereby students work in pairs, and Robinove (120) advocated a special *dictée* for which the students would prepare very carefully. The uses of a language laboratory and recordings were treated by Gaudin (59) and Colman (38). Carefully graded films with recordings were used by Richards and others (118, 119) for secondary and college level French and Spanish. Their modified direct method was based on experience in teaching English as a second language.

Carmody (29), however, disagreed with the use of modified ASTP technics. He asserted that much of the ASTP was a waste of time and money, and that we do not need speed in civilian courses, nor do we need descriptive phonemics or linguistic analyses.

Methods—Spanish

Pitcher (107) recommended application of the ASTP technics and the oral-aural approach to both secondary and elementary Spanish teaching. Moxley (96) discussed a device called *El Misterio* for motivating aural and oral comprehension. The "mystery" consists of a set of written directions which are read in Spanish each day until some pupil solves them. For

students desiring a "pragmatic" knowledge of Spanish for work in South America, Raven (111) advocated aural goals. Bleznick (14) believed that all first-year language courses should be so taught, and Willis (141) favorably described this approach as employed in a large university. A course discussed by Abraham (1) consisted of recordings of 20 lessons with a minimum of grammar, this being introduced only gradually. Blayne (12, 13) believed that students can learn to read Spanish as well as English, and brought out various procedures useful in speeding up silent reading. He suggested that too much training in oral reading may force students to read subvocally, thus slowing up their silent reading.

Methods—Other Languages

Many of the reports cited above have alluded to use of oral-aural methods in a variety of languages other than French, German, and Spanish. Mitchell (94) presented an ASTP approach with recordings and graded texts for secondary-school Russian. One report dealt with Portuguese; this was a wartime study by Cioffari (35) on the use of ASTP methods in Brazil for Army personnel. Reichenberger (113) got excellent results in Italian with this same approach. He indicated that grammar was not stressed, and that the conversational approach improved reading.

Peckett's study (104) claimed that in the teaching of the classics the direct method was first applied in Cambridge, England in 1904. In his discussion of historical trends, he pointed out that language is primarily meant to be spoken and is best learned that way no matter what the ultimate aim of the beginner. Sweet (132) developed a highly promising linguistic and oral-aural approach to the teaching of Latin. He pointed out that the contrast between English and Latin structure is much greater than popularly supposed, and thus the key to his teaching method lies in his stress on the inflectional signaling-devices of Latin in contrast to the positional (word-order) signaling-devices of English. Recordings and other audio-visual aids are an integral part of the method. Else (51) proposed that a simplification of Latin grammar on linguistic principles would do much to improve Latin teaching. Dunham (46) reported various suggestions on high-school Latin curriculums.

Methods—Audio-Visual Aids

Recent emphasis on oral-aural methods has aroused widespread interest in the effectiveness of audio-visual aids. Space does not permit an exhaustive summary, but the following reports are most pertinent. Ebelke (50), Huebener (73), and Harris (66) illustrated the uses and advantages of common types of audio-visual equipment, and Gaudin (58) described how to set up a language record library (*discothèque*). For the minimum laboratory, Rosselot (122) specified three pieces of equipment: a record cutting machine, a wire recorder, and playbacks. Chagnon and Kettelkamp

(31) recommended the use of the microphone for correcting and improving speech habits. (More recently, tape recorders have been favored over wire recorders.) Delano (43) described the advantages of a system whereby students make phonographic recordings of their speech. Girard (61) set up a sample audio-visual unit in French on Brittany, explaining how and where to find materials. One interesting use of audio-visual aids was covered by Meiden (92) in his description of a beginning radio French course. Recordings of different French voices were used with an accompanying simplified text. Other reports on audio-visual aids were those by Ornstein and Johnston (101), Frauenfelder (54), and Lemieux (84); the language laboratory system set up at the Institute of Languages and Linguistics at Georgetown University deserves special mention (41).

The Investigation of the Teaching of a Second Language

The investigation of the teaching of a second language (3) was a research project on a scale somewhat comparable to that of the Modern Language Study of the late twenties. This investigation proposed to compare in effectiveness the methods of the traditional type with the methods being adopted in many schools and colleges under the stimulus of the Army language courses. Altho Dunkel and Agard, the principal investigators, were well aware of the many *desiderata* of an ideal experimental design, they were forced to assemble data in a variety of situations where they were not in a position to specify the procedures which would be followed and the data which would be collected. They were further handicapped by the fact that they could not construct, early enough in the three-year period of the investigation, instruments which in their opinion would be satisfactory measures of oral-aural competence.

Nevertheless, the achievements of this investigation were considerable. An especially clear presentation was made of the possible objectives of language teaching and of the possible ways of measuring those objectives. To evaluate the reading objective, Cooperative Test Service instruments were used, supplemented by a Russian test constructed on the model of the Cooperative tests. Special aural comprehension tests were prepared and standardized on several thousand students; Spearman-Brown reliabilities ranged from .73 to .95. Some work was done with tests of oral production. The experimental comparison of traditional and new-type methods was made by the analysis of data from seven colleges and one high school not stressing aural-oral objectives, and eight colleges and three high schools stressing aural skills as an initial objective and introduction to reading. Practically all the commonly taught languages were involved, and one section of the experiment was concerned with the teaching of English as a foreign language. In a number of instances there were fairly well-controlled comparisons; in others, it was impossible to say whether adequate controls existed. Experimental or statistical matching technics were rarely used, if at all. Focusing their attention on the better experimental

situations, the investigators found a number of significant differences favoring one group or the other. In general, they concluded, the traditional methods produced slightly better knowledge of the written language, while new-type procedures showed a slight edge in producing a command of the spoken language. At all events, the new-type methods did not seem to show the advantages which had often been claimed for them, and the investigators urged modesty on the part of adherents of the newer techniques. They also argued the need for more precisely controlled experiments, to be undertaken when the newer methods might have been further developed.

Despite the generally negative results of the investigation it must be pointed out that no dramatic *failures* of the new-type methods were demonstrated. Rather, both traditional and new-type methods were shown to be wanting in meeting their avowed objectives. It should also be pointed out that it was often difficult to distinguish between "traditional" and "new-type" methods *except* in terms of avowed objectives. There was a good deal of oral-aural work in many of the traditional courses, and there was considerable emphasis on reading and even grammar in the "new-type" courses. Thus, the Agard-Dunkel investigation cannot be taken as evidence either for or against either traditional or new-type courses, even if one disregards the admitted weaknesses in its experimental design. It is significant that Agard is at present intimately associated with a teaching program (at Cornell University) which very much emphasizes the "linguistic approach" and the newer methods.

Other Experimental Studies

Standing almost at an opposite pole from the Agard-Dunkel investigation was a study by Hohlfeld (71), who used extreme care in obtaining matching between experimental and control groups and in following contrasting teaching methods. Twenty-eight college students in two experimental Spanish classes were matched with the same number in two control classes with respect to 17 variables. The experimental teaching procedure emphasized the development of oral-aural skills; a series of phonograph records constituted the chief teaching materials. The control procedure emphasized the use of a textbook, grammatical analysis, rapid silent reading and translation. All classes were taught by the investigator. Comparative achievement was measured after eight and after 32 weeks. Non-significant results were obtained on all parts of the *Cooperative Spanish Test (Advanced Form P)* and for several other tests of the traditional type. "Almost" significant results favoring the experimental group were yielded by an aural comprehension test and a test on Spanish life and culture, while "overwhelmingly" significant results in the same direction came from a phonetic accuracy test and an oral reading test. Thus, the results generally favored the oral-aural emphasis and within the limits of the experiment showed that the experimental group was not inferior even in achieving traditional goals. It is hard to generalize from this experiment

because of the extremely small number of cases (incidentally, small sample statistics should have been used) and because the two teaching procedures probably were not so very different. Even the control procedure seems to have been considerably in advance of some teaching methods the present writers have experienced, but on the other hand, the experimental procedures were not especially radical.

Hamilton and Haden (65) reported an impressive series of experiments at the University of Texas, conducted over a three-year period and involving a total of some 2700 students. The work of each year was devoted to a test of a particular problem in language teaching, and for this purpose students were put into contrasting types of courses. Evaluation instruments similar to those of the Agard-Dunkel investigation were used. The results, interpreted with the usual cautions, appeared to suggest the following conclusions: (a) the differences between traditional and oral-aural methods are slight, in terms of student achievement, but the latter have many features which are worthwhile adjuncts to language teaching; (b) it makes hardly any difference, in student achievement on Cooperative tests, whether grammar is emphasized in the traditional formal manner or whether it is completely de-emphasized and taught purely inductively; (c) the development of pronunciation skills is definitely aided by instruction in articulatory phonetics; (d) it is advantageous to use phonetic symbols in teaching French, but phonetic transcription is unnecessary in Spanish because the standard orthography suffices; (e) of the programs "oral drill plus much grammar" versus "little grammar plus much rapid reading," the latter produces higher average scores in Cooperative tests, while results of the former in oral production cannot yet be adequately evaluated due to the lack of appropriate tests.

Several experimental evaluations and comparisons between "traditional" and "direct" methods were discussed in the symposium (60) mentioned previously. Berrett and others (11) reported on a one-year college-level experiment in elementary German. There were three methods taught at the same time of day and for the same number of hours, but there were no controls in the selection of the groups. The experiment had two goals: (a) an attempt was to be made to achieve two years of reading proficiency in one, and (b) oral-aural skills were to be used only to assist reading, no attempt being made to evaluate them. The three methods were these: (a) all oral-aural, (b) oral-aural but with the added use of mimicry-memorization, (c) half traditional grammar and half translation and reading. Berrett concluded that there is little transfer of oral ability to reading; probably because of their smaller vocabulary content, the first two methods produced students who were on the average poorer in reading than those in the third. On the other hand, results showed that attention to traditional grammar is a waste of time since the average student under methods (a) and (b) was only slightly below the national median on a standard achievement test. He felt student motivation much higher in the oral methods. In the same series of articles, Rehder and Twaddell (112) made

a report somewhat at variance with Berrett's. They indicated that the oral-aural approach was as efficient as the traditional one in the achievement of reading ability, even tho students under the first method read only half as much. Meessen (91) found the same result in a study of reading; he compared a 10-hour-per-week direct approach with a five-hour standard method. Since the latter required on the average five hours of homework per week, and the former none, he felt they were equitably matched on the time factor. He also concluded that the conversational approach was better for reading and aural comprehension but not for grammar.

It is hard to become enthusiastic about the experimental designs and statistical treatments used thus far in studies of foreign language methodology. The investigators have usually been language teachers who are not particularly sophisticated in statistical technic. Rarely are the experiments reported in sufficient detail: one often finds only the citation of a few medians, or perhaps some percentiles. Not a single study reviewed here utilized small-sample statistics, to say nothing of analysis of variance or the Johnson-Neyman technic. The latter technic might, for example, be used to study what methods are most effective for different kinds of students.

Achievement Testing

Examination of standard reference works on testing revealed that few new tests of foreign language attainment were published during the six-year period covered by this review; there were certainly few efforts which attempted to strike out in new directions. Exceptions were found in the work of Agard and Dunkel (3), Lado (82, 83), and Bovée (20, 21). Agard and Dunkel improved on previous aural comprehension tests by using phonograph records and controlling the rate of speech, the length of utterances, and the vocabulary. Objective technics of scoring were employed. Less success was had with tests of oral production, where problems of subjectivity in evaluating responses were encountered. It was also difficult to provide appropriate stimuli for spontaneous speech. Lado attempted to circumvent subjectivity in pronunciation and aural tests by making the use of particular phonemes the crucial element in the correct responses. He also emphasized the necessity for preparing the tests in accordance with the particular difficulties a native speaker of a given language would most likely meet. Bovée devised an ingenious method for evaluating the rate at which reading and aural comprehension in French (or any other language) approaches that in the student's native language. His work on aural comprehension suggested that the reception of speech occurs in terms of "thought groups."

There were several studies of large-scale testing programs. Cheydleur and Schenck (33, 34) investigated comparative results for various types of written and oral-aural tests, and recommended the use of placement

tests to insure that students are placed at proper levels of instruction. Shekerjian (127) found on the basis of test results that pupils from private schools were not as well prepared for college French as pupils from public schools. Dyer (48) studied the use of College Board language tests for placement purposes and suggested that their scores were more meaningful than "years of training." In a later publication Dyer (49) stated that scores on College Board tests could not be taken at face value and should be scaled in terms of the recency of the secondary-school language training. Frizzle (56) pointed to the influence of Regents requirements and examinations upon the teaching of French.

Of possible use in connection with foreign language teaching is the series of *Cooperative Inter-American Tests* (7), which are tests of general ability, reading, social studies, natural sciences, and language usage with comparable forms in English and Spanish.

Prognosis of Foreign Language Learning

Relatively little work has been done recently on the important problem of predicting success in foreign language learning. This is particularly unfortunate because it is conceivable that emphasis on oral-aural skills in contemporary language teaching may throw the problem of prognosis in a different light. Whereas the traditional procedures may have put a premium on intelligence or general mental ability, the new procedures may demand more specialized traits.

Wittenborn and Larsen's (142) important factorial study of achievement in German was overlooked in the April 1946 review of this journal. These investigators studied correlations between various aptitude tests and grades in German. Bovée and Froehlich (22) reported correlations between IQ and achievement in French; different results were obtained for good and poor achievers. Williams and Leavitt (140) found that the *ACE Psychological Examination* and an *Army Language Aptitude Test* were useful in predicting success in learning Japanese. McNaughton and Altenheim (89) studied prognosis in German courses and found that the language backgrounds of the students affected the validity of prognostic tests.

Conclusion

The furor which first greeted the "new-type" methods implied by Army language courses has now waned, but the traditional five-fold objective of language instruction has been seen in better perspective, with due weight given to instruction in the living, spoken form of a language. Now the great need is to develop better methods for doing what language teachers have always wanted to do. In this respect, the contributions of educational research and psychology have continued to be meager.

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CHAPTER VII

Music Education

WARREN S. FREEMAN

THERE is considerable progress to be reported in music education research in the last decade. The latent possibilities of significant, objective research in the various branches of music education is being recognized by scholars in the field in a wide range of research areas.

Large national music education organizations, such as the Music Educators National Conference, thru its Research Council and the Music Teachers National Association, thru its committee on research, and the work of individual scholars in various centers of learning are all contributing a heavy volume of research studies. Many are of real worth and are distinct contributions to the literature. Others have many shortcomings. Lack of objectivity, validity, and reliability are the most common faults. There is much "arm chair" research in the field of music education.

The trends in educational research in music education are directed toward the following areas: curriculum organization and supervision of music instruction; historical aspects of music education; various areas of measurement of musical progress, interests, ability, musical taste, and other correlative studies involving measurement and studies in various aspects of the psychology of music.

Supervision and Curriculum

Problems involving supervision of instruction in music have continued to engage the attention of serious scholars of music education. Christiansen (4), in a study of the schools of Utah, reported a comparison made between two groups of school districts in Utah on the criteria of musical achievement. After the use of established musical achievement instruments, it was found that the districts in which musical supervision had been utilized for a number of years showed more significant educational progress in music than in the areas where no supervisors were employed. Christiansen contended that the employment of music supervisors resulted in raising the level of musical achievement. Nye (17) reported a study of cooperative music supervision which employed the so-called "on call" supervision technic in which the supervisor operates on a consultant basis rather than making a periodic visit on a regular schedule. He claimed that the majority of situations studied preferred the "on call" plan to other plans, altho there was a considerable positive minority against the plan.

Lawshe and Wood (11) found significant results in comparing members of student musical organizations with nonmembers in terms of their musical talent as measured by the *Seashore Measurements of Musical Talents*. They contended that membership in a musical organization was a valid criteria

of musical talent. Blyler (2), in a survey of 125 programs of music education instruction, described the various types of music education courses in colleges of education over the country. She stressed types of programs offered and analyses of textbooks and teaching aids used. In the field of experimental education Ahrens (1) gave the results of a study on the characteristic limitations of internal tuning of wind instruments when played by amateurs. Such matters as the effect of temperature on the internal tuning of the clarinet were investigated. Certain trends were noted such as the trend of wind instruments to play more sharply in ascending passages into the upper ranges of the instrument. Important recommendations were included in the study. It was suggested that more attention be given to the room temperature where musical organization rehearsals are held. Ahrens contended that if instruments were manufactured to play in rooms at a temperature of 72° F. they would play in better tune in the hands of amateur players.

Historical

Few significant historical studies were completed during the past 10 years. Among the best is a study by Sunderman (19) in which he reported on the supervision and instruction of music education in the early days of music education activity in the schools. Such matters as the role of the supervisor, the role of the classroom teacher, various instructional obstacles, examinations and textbooks were reported. The author pointed out a gradual change of attitude in the teaching of music from a purely scientific approach to a philosophy of music enjoyment on the part of the pupils.

Measurement

Many studies have been attempted in the field of music measurement. Farnsworth (7) reported the development of a rating scale for musical interest to measure both general and special areas of interest in serious and popular music. His findings showed an interest in serious music as tested by these scales, showing a high degree of correlation with interest in music as measured by Seashore. He also showed the relationship of these scales to the *Strong Vocational Interest Blank*. Lundin (13) reported a study in the development and validation of a set of musical ability tests to measure musical behavior objectively. The test included: (a) interval discrimination, (b) melodic transposition, (c) mode discrimination, (d) melodic sequences, and (e) rhythmic sequences. Validity coefficients of this test were higher than either the Seashore or Drake tests when validated against criteria used by Lundin.

Lehman (12) made a comparative study of instrumental musicians on the basis of the *Otis Intelligence Test*, the *Kwalwasser-Dykema Music Test* and the *Minnesota Multiphasic Personality Inventory*. His results showed a significant difference between the group discontinuing musical study and

those continuing. The higher scores of the continuing group indicated that IQ might be a factor in the entire continuation situation. The *Kwalwasser-Dykema Test* proved to be a satisfactory predictor for musicianship. The *Masculine-Feminine Interest Scale* of the *Minnesota Multiphasic Personality Inventory* was found to differentiate to a high degree between the "continued" and "discontinued" groups.

Wheeler and Wheeler (20) gave comparisons of the results of certain reading tests and other test scores for a group of freshmen college students enrolled in liberal arts, business administration, music, and education curriculums. Results showed that music students were not superior to non-music students in intelligence and reading ability. In another study by Farnsworth (6), members of the American Musicological Society were polled to obtain rank of eminence and contribution of composers. On the basis of the compared results, weights were assigned and a list was obtained, the purpose of which was to provide the music educator and performer with objective data against which individual evaluations could be compared in a measurement of musical taste. The list was found to have an odd-even reliability of .80+ for children at the junior-high-school level and a reliability of .70 for college students. Fisher (8) reported a study of different age and socio-economic groups in unstructured musical situations. No clear-cut preference difference between the experimental groups manifested itself.

Psychology of Music

Recent research showed outstanding progress in the development of an experimental psychology of music. In reporting on this subject, Diserens (5) stated that experimentation in the psychology of music has been developed to a very advanced stage. The effects of listening to music as it influences the bodily processes has been described, as well as the types of the experimentation and the experimentors in the field of emotional study. He reported that much of this experimentation was based on psychological-musical esthetics, physics, anatomy of auditory apparatus, anthropology, genetics, phonetics, and linguistics. He further observed that the field of musicology correlates musical composition with definite moods, and embraces the entire field of musical research.

Continuing in this field, six principles for music memorization were determined thru objective technics in an experiment by Rubin-Rabson (18). The need for intensive study of each composition before any performance is attempted was stressed as an aid to memorization. This technic was shown to cut the memorization time almost 50 percent in comparison to keyboard-centered memorization. In a review of the literature on absolute pitch Neu (16) emphasized the need for an adequate explanation of absolute pitch. His research indicated (a) absolute pitch, in lesser degrees of discrimination, can be acquired; (b) behavior that entails pitch discrimination gives a greater opportunity to develop keener pitch discrimination; (c) pitch discrimination can be acquired more readily at an early age; (d) the de-

velopment of keener attending to stimuli makes for keener development of pitch discrimination; (e) behavioral development is subtle; that is, individuals who have built up keen pitch discriminations may suddenly realize what they can perform. The dynamic music factors in mood were attributed in a study by Gaston (10) to rhythmic influence: *legato* and *staccato* sounds. Mood change found in dance, march, chorale, and lullaby music were exemplified. A definite influence of music on muscular tension was noted.

Musical Behavior

In a study of the emergence of musical behavior, the beginnings of certain universally present basic tendencies that were thought to provide the key to a universally applicable system of control were observed by Fultz (9). Musical behavior was found to emanate from universal impulses, making control and guidance of each behavior accessible. These basic music skills were determined to be (a) rhythmic structure, (b) melodic contour, (c) tonality, (d) harmonic sequence, (e) tone color (vocal and timbre [instrumental]), (f) dynamics, (g) technic. These basic skills were observed to be the universally available means of human adjustment to stimuli and are not specific talents. A psychological study of a somewhat different nature by Mull (14) indicated that music without title or program notes can express humor. The objective feelings of 30 "musical" college students while listening to three selected recordings showed that there was much unanimity of opinion as to which regions in music are humorous; that music with or without title or program notes can express humor; that sources of humor are both intrinsic and extrinsic. It was suggested that a quick motor shift (*volte-face*) is the basis of humor, in conjunction with a nonpractical attitude.

In studying growth gradient in music, Mursell (15) identified 10 growth steps in the sequence of musical development: (a) undifferentiated but significant emotional responses to tone; (b) beginnings of differential response to tonal patterns; (c) beginnings of pattern-wise differentiation; (d) beginnings of responsiveness to different tonal media; (e) beginnings of responsiveness to different types of music; (f) beginnings of response to and interest in the rhythmic component; (g) beginnings of contact with standard instruments; (h) beginnings of definite achievement with the performing media, particularly the voice; (i) creative and compositional activities differentiated more explicitly; (j) true specialization. Brady (3) in a somewhat similar study described song as an emergence, not an inborn talent. Biolinguistic principles were stressed as having outstanding importance in the teaching of song and speech. Viability, coordination, and epicritical associative gradients were set forth at various levels of emergence. It was suggested that since the Seashore pitch test is a measure of emergence in its final stage, it is not a measure of aptitude but of achievement.

Considerable progress has been made in university-centered research in

music education in the past decade. The volume of research has been heavy and altho much of it is of unreliable quality, certain studies have been valuable contributions to the literature of educational research. There are signs that music education is coming of age. Its research results are one indication of this fact.

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CHAPTER VIII

Fine Arts

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MUCH of the literature concerning the fine arts is descriptive, due largely to the *nature* of the art activity and the problem of analysis of its components. Attempts have been made to apply scientific methods of inquiry into the fundamental problems of creation and appreciation of art with little success. This may be due in part to a lack of understanding and agreement as to the function of art, the nature of the creative process, and the appreciative act. Unfortunately little correlation can be found between the speculative theories of estheticians and the purposes of practicing artists or art educationists.

Most research in the fine arts starts with rational hypotheses based on the nature of art products rather than empirical investigation of the physical and psychical nature of art as one continuous human process of creation, culminating in appreciation.

Investigations should be undertaken by objective researchers into those aspects of this total art act which *can* be scientifically measured to determine whether there are significant correlations between physical being, mental states, emotional attitudes, feeling and creativity.

Esthetics, Appreciation, and Criticism

A re-examination of the fundamental purpose and scope of esthetic procedure occupied a number of writers. Aiken (1) proposed searching for an empirically scientific esthetic. To achieve this demands a strict adherence to logic in all proceedings, and the use of empirically provable facts, judgments and standards only. The subjectmatter of such an investigation would include only esthetic modes of experience, would consider all esthetic phenomena that the mind is capable of attending, would take into account the cognitive as well as the affective faculty, and would make a more thorough investigation of the intrinsic value of esthetic experience. Weismann (103) discussed the creative process as an active critical participant. He believes that a great deal of the confusion in contemporary esthetics stems from unqualified judgments. Art historians can deal only with the chronologies in which art works and movements find places and historical logic. Bayer (12) sees the need for a more ordered approach for he stated that historically esthetics has been a series of philosophical systems of beauty. A method dates from the nineteenth century. As a solution to the apparent paradoxes that exist in esthetic thought, he suggests operative realism in the place of mental systems, which is more precise. It demands, in short, a *physics* of art. Feibleman (37) agreed, stating that art is fundamentally rational. It seeks objective value. Hospers (52) critically analyzed the concepts which reoccur inevitably in art criticism.

The influence of scientific thought on art is shown in the more objective approach to esthetics, and from a preoccupation with the physical concepts of time and space. Souriau (99) showed that art creates its own universe and so has dimension, aspect, rhythm, and tempo. In art, he said, time is mastered, fashioned and formed to vary it. Berkman (14) stated that contemporary art space concepts are qualitative while Renaissance concepts were quantitative. Calas (23) wrote that the basic function of art is not solving technical form problems but that of helping one overcome fear by developing a space consciousness. In relation to this Biederman (17) attempted to show that the artist has oriented himself to the world in which he existed. This mode of orientation has progressed and/or regressed since Paleolithic times. He predicts an era of mass-produced, machine-made art centered in the United States.

Further relation of art and science is indicated by Laporte (63) who thought that new concepts in painting could be correlated with those in physics. He claimed that art shifted to a new conceptual abstraction when it found that exclusive emphasis on perception was in itself a concept. Gauss (40) indicated a similar parallel or analogy in the development of philosophic thought and esthetic theories of French artists from 1870 to the present. Garrison (38) added his view to that of Laporte in relation to the shifting to a new concept of art because he indicated that historical art and contemporary art cannot be compared for reasons of their difference in concepts.

Gasset (39) and Mirabent (74) see this movement toward the objective as a reflection of the general trend toward dehumanization in our society. Mirabent in tracing esthetic development in Spain sees a moving away from the present elemental state toward a participation in the general unrest concerning contemporary esthetic concepts. Gasset believes, and so stated, that this dehumanization in esthetics is part of a general social trend in this direction and sees this leading toward an art that is only intelligible to the artist and consequently hateful to the bourgeoisie, in a sense dividing society into two classes and thus saving it from the fallacious assumption that all men are equal.

Opposed to the apparent trend toward the objective method of esthetic investigation is Carmichael (26) who claimed that an objective criticism is in contradiction with the meaning of art, since art is autonomous, unique, and free. There is some substantiation for this view from Boas (18) who, in discussing Aiken (1), agreed with a more objective approach but took exception to its rigidity when he stated that other activity besides esthetic activity has relevance, that art is the satisfaction of human interest as well as technical form manipulation, and that esthetic values are both terminal and instrumental. The case for subjectivity is reinforced by Pepper's (83) psychology of taste based on intellectual judgment, by Giedion-Welcker (43) who sees the beautiful as the accidental and who said whimsey and irony are the key to art. Guggenheimer's (47) theory that the artist works thru insight to the intuitive perception of wholes would

seem to add a qualification to this trend. Berenson (13) stated that art has a tonic effect in that it gives the appreciative observer a state of well being. The business of the critic in this view is to apprehend the qualities that make for this state of well being and to make the public aware of them. Appreciation is "ideated" by the work.

Some mediation between these apparently antagonistic points of view is attempted by Romanell (94) who stated that tho there is no common ground, theoretically, between the realistic point of view of Dewey and the more idealistic concept of Croce's, there is agreement on the basic assumption that the proper subjectmatter of an art philosophy can be nothing but esthetic experience. This seems in agreement with Aiken's premise but differs from Boas's assertion that experiences alien to esthetic quality may have relevance in art activity. Giedion (42) concludes that an equipose between the rational and irrational, temporal and eternal, between the human body and the cosmos is vital.

Another point of discussion in this re-examination was a concern with the esthetic object and its effect on the spectator. The esthetic concept of psychical distance reviewed by Chandbury (28), who stated that Indian esthetics of the tenth century pivoted on this single concept: the deindividualization of the esthetic object. In view of the preceding discussions concerning the trend toward dehumanization, this has specific relevance. The Indian thinkers of this period conceived emotion expressed in art works as universal in nature and as existing independently of the individual, with the spectator neither anxious to continue nor anxious to stop it. Specifically, joy, pain, and other emotions are felt but in a manner foreign to the real, that is the practical and scientific effects of these emotions.

Further discussion of this relationship was expounded by Muller-Freienfels (77) who held that art works manifesting the object are more valuable if they make visible aspects that the eye does not see. It is necessary to understand why the artist departed from the so-called visual representation of the object. Pictures of this sort, in his opinion, substitute free creations of the imagination for reality. Thus, he said, art becomes symbolic by making visible what we cannot see. Ivins (57) sees this relationship as a duality, as a work of art and as an object. The art quality or wholeness of effect cannot be described and must be seen to be appreciated. The quality of the object, however, can be described.

Thru a psychological investigation of the creative process, the critical theory developed by Isenberg (56) distinguishes between critical communication and nominal communication because symbols tend to become independent of sense-perception. Critical communication is apt to be hindered by the artist's sensorial reactions. The psychologist may ultimately have to supply the causative explanation. The psychologists have come to believe, according to Arnheim (3), that expression is the primary content of perceptual experiences. Expression must predominate because it is the key to meaning. Potter (86) discusses the new possibilities for expression

such as (a) color music with the organ, (b) abstract films, (c) abstraction in the dance, (d) other forms of visible music, and (e) sound to sight translations of speech.

Psychology and Psychoanalysis of Art

The impact of psychological thought has been felt in art and esthetics for some time. In recent years the influence of psychoanalysis as a method of diagnosing the artist's behavior, the nature of the creative process, and the purpose of art in society has received considerable attention.

Not all investigations of a psychological nature were objective. Malraux (72) in a series of books on the psychology of art concludes that such a study is not concerned with the analysis of perception but should stress relations between the art object in its cultural setting, the creative act, and recreative pleasure. He states that due to the comprehensive pictorial art history made possible thru photographic reproductive processes, art objects lose their contextual placement and assume new meanings. This change in view toward the art work tends to isolate the "creative act" and produce more clearly the artistic substance called "style." Style now means more than organized forms expressive of a period or people; it is a system of organized forms, owing nothing to imitation, which defies the scheme of things thus creating the world anew. Art generates art and in so doing opposes the pressure of the outside world.

Reitman (92) offers an antidote to the spicy esthetic vagaries of our own psychoanalysis and distrusts psychological explanation. He says that art is a mental manifestation based on human cerebral function. In the psychotic product the lack of structure derives from the disintegration of perceptual relations and concepts whereas the modern artist restructures deliberately. To the schizophrenic pictorial distortions are real and symbols are taken literally. The schizophrenic paints to adjust himself to his altered reality.

According to Schneider (96) the neurotic source of art is an illusion. Art is not primarily a therapy for the depressive effects of violent and intolerable aggression. The Oedipus complex is perhaps the underlying cause of all artistic conception. Schneider also concludes that symbols tend to disguise unconscious insight, yet a work of art has a peculiar symbolic prehistoric power.

Analyzing an artist's reaction to oppositions from the real or practical world, Schneider (95) showed that the criticism of Picasso's first big show gave him a personal sense of failure. From this time he has continually striven for the new, the imaginative, and the fantastic as an assurance from being called imitative or sentimental. His imaginative discoveries can be summed up thus: (a) an infusion of forms with a highly psychic tension achieved by various forms of distortion, and (b) an intuitive investigation of time and space relationships with reference to the mass and dimension of the body.

In concluding that there is an analogy between the artist's inspiration and the dream, Born (21) pointed out that both are based on the dynamics of the unconscious, but that the transformation of inspiration into a work is essentially a conscious activity. Further examination of creativeness by Lee (64) showed that during this process two distinct classes of feelings were projected by the artist: (a) the emotion that is projected in time and space relations as esthetically moving forms, and (b) the feeling that is expressed in the subjectmatter.

Lowenfeld (68) found in the blind the purest form of nonvisual creations.

Rau (89) compared the theories of play of Schiller, Spencer, and Groos. Groos takes play seriously—not all play is trifling and dalliance, it is not mere fun. Much so-called play is earnest and creative. It is always important biologically and sociologically.

Evans (35) in discussing color stressed the physiological, physical, and psychological aspects.

Gibson (41) proposed the theory that visual space-perception is reducible to the perception of visual surfaces. He made a tentative list of phenomenal properties.

Learning and Creativity in Art

Fostering creativity has become a main consideration in the learning process in the field of education, as was pointed out in the yearbook of the Association for Supervision and Curriculum Development (6) which stated that the school must help the student become a creative individual—creative in his approach to people, problems, and materials. Dorner (33) also advocated a creative approach to human problems, saying that there has emerged a new interpretation, one which gives promise of serving as a basis for the integration of the arts with our present society, stating too that educators should be more concerned with creative growth than with so-called timeless truths. There has been like interest in the benefits afforded students thru creative experience in art. Hubbard (55) stated that creative experience with art developed better citizens because of the understanding and appreciation which comes thru art. Welling (105) fortified this point of view by saying that a creative art process acts as an inspiration both to the doer and to the observer, causing them to have a more inquisitive, interpretive outlook toward the world around them. Acknowledging the need for creativity in education, particularly in art education, several writers have defined creativity in relation to art. Among them being Pepper (82) who stated that a work of art was a creative achievement if the demands which arose out of that work were satisfied within it. Pepper also said that creativity was not involved in any way with the mastery of a particular technic or the copying of another artist's style or painting, and that the realization of these facts was necessary in the education of an artist, an art critic, or an art historian. Dewey (32) defined arts and their

creative esthetic experience as intentionally cultivated developments of a primary esthetic phase. Portnoy (85) in a paper concerning a psychological theory of artistic creation, said that a creative act involved the conversion of human emotions which seek and find expression thru the artist's sensitivity to formal design and his mastery of a technic, which enables him to make concrete his visual and auditory phantasy. Further stating, that as a result of the sensitivity with which the artist reacts to his environment, he (the artist) must of necessity create if he would retain his sanity. Portnoy advanced the theory that artistic creation was elicited in two ways, spontaneously by external stimuli, or consciously by indulging in thought meant to bring on a mood conducive to creation. Portnoy rejected mysticism in artistic creation by stating that no work of art has as its inspiration anything other than what is ordinarily accepted as reality because the artist is not divinely inspired, nor is he a prophet of the future, but rather a creative artist who becomes aware of the happenings of his generation prior to his contemporaries. Morgan (76) pointed out that psychoanalytic-esthetic hypotheses were not entirely invalid, but were limited in that analyses of the unconscious were in themselves hypothetical. Other writers have been concerned with means of eliciting creativity among students. Arnheim (4) advocated a sound educational basis for students of art, an education which enables the artist to grasp the whole situation and the ability to use the essentials in an original manner for the purpose of reaching a goal, also stating that there is a visual reasoning similar to theoretical reasoning. Clarke (29) advocated the "non-system" of Korzybski which rejects the assumption that words can tell all about a nonverbal object. He found that orientation in nonverbal thinking leads the way to predictability in the process of abstracting. Herring (49) warned against the use of an academic procedure in attempting to elicit creativity, which blunts the student's natural growth in art by setting before him false adult standards. Herring also pointed out that the teacher in such a case must be just as willing to learn as he expects his students to be, if creativity is a value in his art program. Pepper (84) put forth a theory that creativity is only advanced with the student's increase in interest brought about by association with a teacher who is a creative artist. Weisskopf (104) discussed the role of education in the creation, saying that creative insight often comes best when the student is freed from carefully controlled intellectual technics such as "industry," "regular study habits," and a "critical controlled attitude." Writing further, Weisskopf said that educators may find it profitable to practice a passive attitude as a stimulus during a specific phase of intellectual and creative work. Giving the student the possibility to express himself freely and boldly, and demanding that the student do so in compatibility with his inner needs was the viewpoint of Burlin (22) who also said that a teacher of art should be concerned with the intuition awareness of his students. Welling (105) advanced the viewpoint that it is the teacher's obligation to allow freedom of expression thru direct experience in art, thus building confidence and providing a

stimulation for further work. The yearbook of the Association for Supervision and Curriculum Development (6) pointed out that experimentation was necessary to creativity, but that spontaneity alone presented no challenge to the student, adding the belief that it is a misconception to analyse the art act as if it were based on maladjustment.

Studies in Appreciation and Teaching Method

The growth and influence of art's importance in the school program continues to interest writers. Shackson (97) reported on experimentation with an adoption of a general education course on the college level in music and visual arts offered to students in other college departments. In connection with the trend toward art as a general subject, the increased importance of the art teacher in the school program became a subject of interest. Howell (54) discussed the art teacher's role in the total school program from the viewpoint of modern educational aims in which the art teacher becomes a guide and resource person aiding the growth and development of the students. In order to develop such teachers, Alford (2) urged training which will equip the individual with historical, philosophical, as well as technical background thru the humanities and other courses which deal in ideas, values, thought, and feelings. The aim of these educational concepts is total personality development, and on this basis the creative process is emphasized over the final product. In order that the teacher acquire the necessary psychological insight into creative experience, understand materials and how the child finds his own expression in terms of them, Lowenfeld (67) recommended active creatively productive teachers. Jules (59) discussed the benefits to both artist and school when the creative artist as a teacher brings his theoretical and technical knowledge and first-hand understanding of the creative process to the school. Masley (73) maintained that changing philosophies in art education have resulted in a cleavage between fine arts and art education programs thru stressing individual adjustment over the end product. This has caused the professionally trained artist to dismiss the art education program as inconsequential, emphasized the complexity and importance of establishing a program of evaluation which is closely interwoven with all aspects of learning and instruction, and which would furnish the teacher with a means of self-inspection and help the student in his growth. McKibben (70) listed the various resources of the art teacher and commented on their uses in the art class.

Pepper (83) writing on art appreciation discussed the psychological and esthetic qualities contributing to success or failure in works of art, and pointed out aims and functions of art. Halperin (48) combined art appreciation in an eleventh-grade literature class with an experiment in creative writing using large reprints of famous paintings as stimulation. The form and content of the paintings were discussed, keeping in mind similarities and differences between the art forms of painting and literature. The class

was given the problem of writing a short story, series of impressionistic sketches, or dialog from the viewpoint of an observer projected into some part of the paintings. An appreciation of the beauty and interest which can be found in the ordinary neighborhood was reported by Howell (53) as an effective stimulus for creative expression in different media for high-school art classes. Appreciation on the elementary level was studied by Ringham (93) who reported on children's preferences for textile patterns based on data from a study in which 521 children between the ages of six and 15 were shown a series of modern Occidental, Oriental, African, and other patterns and asked to state their preferences. The average child interpreted choice in terms of general, personal, and associative qualities, but children with some degree of art training appreciated patterns for technic, line, shape, texture, and originality.

Carter and Fox (27) conducted a survey of art practices and attitudes of elementary teachers using questionnaires and sampling technics which gathered information on distribution and extent of activities in art, time devoted to art, art background of teachers, and other aspects in the teaching of art. Findings were compiled and expressed in percentages and fractions. Altho art activities were found to be wide in range thruout the area covered by the survey, there were many schools with inadequate provisions for art and a few with no art at all. It was noted that time devoted to art increased with the size of the community and that teachers in larger cities received help from supervisors and teaching aids, while there was little or no help in the rural areas. There was great dependence upon holidays and seasons as sources of inspiration, and 40 percent of the teachers reported occasionally dictating the art lessons. Most reported facilities as inadequate, 25 percent had none, and only 5 percent stated that they had adequate equipment. Only 7 percent reported adequate materials and supplies. Less than half provided for creative self-expression experiences in the art period, less than one-third provided for esthetic appreciation. Fifty percent of the teachers felt confident of their ability to teach art, with smaller percentages claiming a lack of ability, training, or supervision; 60 percent believed that art should be taught cooperatively by classroom and special teacher. Few elementary teachers had more than a small amount of art training; 40 percent claimed that the attitude of the community toward the art program was one of indifference.

A trend to revive the humanities as a balance for the sciences in education was discussed by Rannells (88), who stated that some colleges have attempted to bring philosophy, literature, and fine arts under a humanities division in the development of a general humanities program. Methods, administrative procedures, and content of courses were suggested.

Tests and Measurements

Barrett (9) undertook an investigation to determine the validity and relation to intelligence of the *McAdory Art Test*, the *Meier Art Judgment Test*, the *Knauber Test of Art Ability* and the *Lewerenz Tests in Funda-*

mental Abilities of Visual Art. A criterion of art ability based on judgments of pupils' classroom work was established. Sixteen classes were given the McAdory and Meier tests. A smaller group was given the Knauber and Lewerenz tests. Coefficients of correlation were worked out for each of the tests with each of the other tests, with the art ability criterion, with intelligence quotients, and with school marks. Partial correlations were then calculated keeping the intelligence factor constant. It was found (a) that the McAdory test is of little value in predicting success in school art; (b) that the Meier test has some predictive value, so far as success in school art is concerned, but this value is less than that of school marks; (c) that intelligence influences art test scores and significant with this correlations were found in all except the McAdory test; (d) that factors which determine success in other school subjects, such as work habits and attendance, play only a small part in determining success in art tests and school art; and (e) that art ability is measured reasonably well by both Knauber and Lewerenz tests. Barrett stated that these tests have high predictive value regarding success in school art but believed that they were primarily achievement tests rather than tests of native ability, and scores are influenced by nature and amount of previous art training.

Reporting later on the McAdory and Meier tests used in determining sex differences in art ability, Barrett (10) again used criterion based on classroom work on Grade IX level. The conclusion based on the results showed that Grade IX girls made higher average scores on these tests as well as on school art exercises. Prothro and Perry (87) worked with the Meier test with four groups each composed of 100 individuals; the first group from a university for Negroes, the second from a university for whites, the third from a city high school for Negroes, and the fourth from a city high school for whites, in an attempt to determine if membership in the groups studied is associated with the differences seen in test performances. It was found that whites rated significantly better than Negroes, college groups better than high-school groups, but no noted differences based on sex differences were indicated.

Woods and Boudreau (107) reported on experimentation attempting to determine the influence of design complexity on visual processes of artists and nonartists. Brandt's technic for measuring differences in eye movement with the bidimensional camera was employed. Two charts were prepared with the area divided into four sections, and in each section a black and white, nonobjective design was placed, proceeding in complexity within the four sections of each chart. Charts were placed in position on the rack of the camera, and subjects were asked to review the designs for eight seconds. They were not told what to look for. Responses were analyzed in terms of (a) mean time spent by each group in observing each area of each chart, (b) percent of total time spent in viewing each area of each chart by each group, (c) percent of initial fixations made in each area by each group, (d) percent of total eye fixations made in each area. Data suggested that differences do exist between artists and nonartists and

between age groups regarding design complexity as a determinant of visual attraction, and that art groups are more sensitive to more complex design units than nonart groups.

A test to measure creative thinking was administered by Dougan, Schiff, and Livingston (34) to 33 employees in the display department of a large department store using the *Welch Reorganization Test* in which the subject recombines familiar ideas according to four different patterns. The test assumed that the ability to recombine easily and reorganize ideas according to a specific plan is essential to all types of creative thinking. It was divided into four parts, three using written material and the fourth using blocks. The subjects, who included artists, display men, designers, stylists and executives in charge, were rated by their supervisors using a five point rating given by the supervisors and the scores from the test. In two previous studies the test was given to 30 professional artists, 25 art students and 48 unselected students. It was found that there was a statistically significant difference between the professional artists previously tested and the display personnel. Display personnel were superior to the unselected students on two of the subjects. These results indicate that there is a possibility of measuring originality as it would apply in the fields of advertising and display.

Woods (106) investigated the role of language handicap in the development of artistic interest. The evidence presented indicated that a negative correlation exists between artistic interest and academic accomplishment measured in terms of grade completed in school and ability in the *Army Alpha Test*, that a positive correlation exists between artistic interest and mechanical ability, and that a negative correlation exists between verbal and computational interests and artistic interest.

Berman, Klein, and Lippman (15) reported on the use of human figure drawings as a projective technic and as a supplementary source of information for other standardized projective tests. The test was given to 100 psychoneurotic patients, each of whom was asked to draw a human figure on one side of a sheet of paper and then to draw another figure of the opposite sex on the other side of the paper. Psychologists found the drawings of value in describing a patient's personality structure and in detecting emotional difficulties or maladjustments. These findings were compared with results psychiatrists had obtained from the psychiatric interview technic. Points of agreement established the reliability of the human figure drawing test as a projective technic.

A new method of scoring tests for color-blindness was investigated by Reed (91) who claimed that error scores in the measurement of degree of color deficiency were inefficient. Using a panel containing 48 red and green jeweled lights, Reed ran a preliminary test with the lights at full voltage. The subject sat before the panel near two telegraph keys and was told to press one if the lights were all the same color and the other if some of the lights were different. The scores were found to be high for the color-blind subjects because the bluer characteristics of the strongly

lighted greens made them distinguishable from the reds. In the actual test the green lights were lowered in intensity by the use of filters. This caused them to become more yellowish and consequently closer to the red light along the confusion line for the color-blind subjects. Error scores again favored the color-blind participants but reaction time records showed a significant lag between switching of the lights and the choice.

Beverly (16) defined evaluation in art teaching as "a means of helping the student in his growth" and from this definition she set forth some of the needed criteria for evaluating the teacher as well as the pupil in art education.

Wrenn and Dreffin (108) tried to determine criteria for selection of a vocational sequence in commercial art at the University of Minnesota General College. Criteria were believed to be found in spatial relations ability, scholastic aptitude, and vocational interest profile of art laboratory students.

A test for spatial relations ability was devised for art laboratory students. Conclusions indicate a commercial art sequence for general college art students possessing above average spatial relations ability, liberal arts freshmen with above median scholastic aptitude, and those who have a vocational goal in commercial art.

The problem of measurement in art led Gordon (44) to conclude that relevant variables are too many and too subjective to allow for scientific measurement in art.

Art Education

Recent research and articles concerning the directions of art education indicate a continued investigation of previously established trends. The desire to establish art as a part of an integrated educational program in order to develop in everyone creative and intellectual capacities on an individual and group basis, concerned many writers. The important role of the creative act in developing awareness, understanding, and better citizenship is being felt on national and international levels. There is evidence of attempts to have art accepted by a wider audience, utilizing to a greater degree facilities long neglected or only timidly utilized such as the newspaper, radio, television, and industry. Investigations show the need for further study in philosophy of art education to implement art teaching methodology.

Hirsch (50) was concerned with the direction of art education. He discussed its trends and showed why certain views are held. In 1951, for the first time, a yearbook was published by the National Art Education Association. Ziegfeld (111) points out that it not only is the first professional yearbook of a national art education organization, but also that it is concerned entirely with professional art education problems and issues. This represents concrete proof of an increasing maturity of the art education field.

Ziegfeld (110) pointed out the necessity for education which would lead to a more integrated pattern of individual and group living. He emphasized the need for emotional development saying that art activities are the means of accomplishing this aim. He suggested that the greatest need might be a more adequate general education among teachers and administrators.

Parkhurst (80) studied 100 children of different age levels, from different schools, showing that the children are aware that art is emotional articulation and that practice is of prime importance. They indicated preference for the teacher who allowed freedom of expression.

Ziegfeld's (110) attitude was supported by Young (109) who pointed out that various aspects of our culture have robbed today's man of his right to use his creative capacities fully. He emphasized that mass media of communication has contributed to this tyranny, showing how the student today can expose himself to hours of listening and looking but is seldom allowed to participate. Educators have not used these channels as they should and are particularly guilty of using commonplace material.

The College Art Journal (30) urged the development of art in general education thruout the world, calling for greater utilization of art to strengthen international cultural understanding. Recommendations were made for establishing a system of national committees and an international council for the arts in general education. Greene (46) pointed out that mankind could avoid disaster thru cooperation in widely shared art activities and inspiration toward noble things by the influence of creative artists. Dangers may be found in each of these approaches if the artist's leadership fails. Art education may establish the proper relationship between artists and community if a nonauthoritarian program can be established.

Barkan (7) explored the value of art education to society and stated that the development of social values developed as we acted, was involved in the way we acted, in the way we reflected upon what we did, and in the way we tried to achieve promising purposes.

The social needs of an art program was explored by Johnson (58). He maintained that the program should be democratic, allowing for freedom of action and choice, having the active participation of all concerned. He pointed out that the art administrator should not direct the program rigidly, but should be more like a consultant. Baumgarner (11) concurred with this point of view, discussing procedures and problems of initiating an art program. She advocated knowledge of psychology, sociology, child development, with the ability to inspire others to contribute, for "the art resource person."

McMenamin (71) called attention to related aspects of the arts, citing the need for art to become a part of an integrated system of education able to explain all human acts. He advanced the belief that the universal nature of the expressive act is the common denominator of all the arts and pointed to the teacher and administrator who understands this as the greatest need in an art program. The objective of such a program would

be behavior changes that have significance. The most important single insight to be gained is comprehension of forms as an aid to perceiving systems of meaning.

Pearson (81) pointed out that if the arts are to be factors in integration of modern living, they must play a similar role in the life and education of the child. He listed the components of creative art as being penetrating vision embodying (a) an adventurous spirit, (b) interpretation of the subject into symbols, (c) self-expression thru creation, and (d) design. How each of these works toward integration of life activities is discussed.

Logan (66) drew a comparison between Froebel's Kindergarten and the Bauhaus. He said they were alike because both were classical art academies which stressed education thru vision, the sense of touch and by means of the tools available. He pointed out how both the Bauhaus and the Kindergarten have influenced subsequent teaching on their respective levels. He suggested that presentday kindergartens might take a suggestion from the Bauhaus movement and go back to some of the disciplines of Froebel's Kindergarten.

In discussing teaching methods, Landis (62) advocated a meaningful approach which offered valuable material on developmental learning. Her approach was concerned with the new directions suggested by Dewey: (a) purpose is essential, and (b) there must be some relation between the means and accomplishment. The method supports the Bauhaus objectives in its concern with esthetic qualities such as beauty of materials, beauty of form, and beauty of meaning.

Greene (45) studied basic concepts in art teaching. He pointed out that these concepts have been borrowed from general education. In advocating alteration of the concepts, he suggested that the principle of increasing independence should be changed to one of increasing definiteness of instruction. The principle of socialization should not hamper art students thru group opinions. The objective viewpoint should be replaced by the creative attitude and the preoccupation with flexibility should not stymie the artist. Trauger (102) discussed a method of related teaching on the college level to understand expression in the various arts. The program consisted of a cooperative system of two-hour classes three days a week, alternating in art, music, and English.

Hirsch (51) mentioned relaxing the standardized admission procedures in colleges in favor of straight thinking rather than procedures concerned only with accumulating a mass of undigested subjectmatter. The Educational Policies Commission of the National Education Association (78) called attention to the need for leadership and suggested that the school can help by identifying their gifted students and providing appropriate educational opportunities for them. Lissim (65) found vast differences in art programs in adult education thru a questionnaire sent out to 114 universities, colleges, museums, art schools, and libraries. The role of the classroom teacher in the improvement of art instruction was discussed by Fairchild (36). She emphasized the need for teachers to provide pupils

with a creative approach to living thru art activities with whose processes and procedures she is familiar. The need was pointed out for a special art teacher working on a flexible schedule to allow time for planning with the groups and classroom teacher. Siedschlag (98) illustrated the value of a resourceful teacher in meeting art needs in the school.

A forum sponsored by the *New York Herald Tribune* and New York City Board of Education (5) developed the theses that (a) since art is individualistic, it should be a basis for education in our democratic system; and (b) awareness of art and its vital role in contemporary life cannot be initiated on a school level unless teachers are alert to current cultural forces. Tetkowski (100) reiterated this need when he pointed out that the art teacher had to bring art to the whole community. The relation of the teacher to society was further explained by Olsen (79). He pointed out that everyone who affects the choice of others could be termed an art teacher. The professional art teacher, properly developed, can affect the taste of the community more effectively than others and at the same time counteract the effects of bad taste imposed by would-be art teachers. Kainz (60) mentioned that teachers need to develop a sound personal and professional philosophy.

Barkan (8) stated that the core of a teacher training program should recognize the position of the arts in our culture and education. He maintained that the teacher in training should be allowed to develop his own point of view in order to grow in ability and understanding. Pepper (84) stressed the importance of the art teacher having knowledge and feeling for his subject. He insisted that the education of a trained art teacher should be centered in the art department of colleges. Danger of authoritative imposition from false conventions may arise in educational theory with no genuine art value, he stated.

A thoro examination of the problems involved in the determination of teacher qualifications in art was made by the First Committee on Research of the Department of Art Education of the National Education Association (31). The members set no hard and fast listings of courses or didactic standards for a program. They furnished concrete ideas encompassing areas of experience which characterized the work in particular courses. They also maintained that training should provide creative art experiences for prospective educators. Such experience should be followed by training in methods of teaching art and then practice teaching. They considered the personality factors of good art teachers and recommended better techniques for selecting candidates in colleges. The report explored problems relating to specific types of art teachers ranging from general classroom teachers thru college art teachers and art supervisors.

Art and Personality

The theme of personality development thru art has continued to occupy the attention of art educators and psychologists. There was also research

on the use of art as a clue to understanding normal and abnormal actions thru self-analysis, observational analysis, and analysis of intentions in art products.

Read (90) wrote on discipline in art, pointing out that freedom in education is misunderstood and abused. He pointed to the benefits of correctly controlled discipline and stated that spontaneity holds the secret of life's problems. Vitality is voluntary. Discipline is a state of being, an achieved perfection. He maintained that child development could be built up as a sequence of unconsciously acquired disciplines showing that this type of discipline integrated the individual with the group and still allowed him to retain his own individuality. Basic human needs were discussed by Timmins (101) who compared growth in plants to growth in children, saying that both grew by their own creative energy. This and other factors revealed to him the basic human need to act, to go thru the dynamic process which is creative expression. He indicated that cooperation rather than competition was the keynote of survival and pointed out that the great problem in our schools is to teach the common learnings required by the culture without denying the psychological growth of the individual. He pointed out that art educators face the challenge and opportunity to put into practice permanent values of the arts for personality development. Cane (25) followed this trend by emphasizing the cathartic value of art as an integrating force in personality growth. Her teaching method seeks a solution by adopting the clinical technics of psychology, because of her belief that creativity is dependent on psychological integration.

Machover (69) conducted a study concerned with personality based on the assumption that there was an intimate tie-up between the figures drawn and the personalities of the draftsmen. Modell (75) used drawings as a means of personality investigation. He found that psychotic drawings are evidence of regression. He found that drawing changes correlated with recovery to a significant statistical degree. Studying a paranoid schizophrenic Karland and Patti (61) found that his art productions indicated aggressive trends towards women. His symptomatology demonstrated fear of hurting his mother. It was believed that his symptoms were lessened thru drawing. Campbell-Fisher (24) ran experiments in which a given title is associated with its corresponding "montage." There was agreement on the nature of the expression quality of these "montages" since a high percentage of title appreciative agreement resulted. Some possibility that the more naive felt these relations more directly was also indicated.

Borg (20) made a study of the relationship between general intelligence and art success in college. He reported that in tests run at the University of California using the *A. C. E. Psychological Examination*, evidence indicated a positive relationship in the degree to which success in college art correlated with artistic ability and a low positive correlation between IQ and artistic ability. In another study Borg (19) isolated some specific factors relating to art school success. A group of 90 advanced students of the California College of Arts and Crafts were given four standardized

tests on adjustment, mental alertness, mechanical comprehension and vocational interest. Findings indicated that in the group tested persons of artistic ability do not deviate reliably from the norm in the personality traits tested. No relationship was found between success in art courses and linguistic intelligence, as measured by the *Thurstone Test of Mental Alertness*. The art group was superior in linguistic intelligence. The group tested was relatively weak in abilities measured by tests yielding "Q" scores on the Thurstone Test. Art students scored higher than technical high-school students on mechanical comprehension as measured by the *Bennett-Fry Test of Mechanical Comprehension*. There was no relationship between mechanical comprehension and intelligence within the art group, but in most groups tested there is a statistically significant correlation. No relationship was found between success in art courses and scores on the artist scale of the *Strong Vocational Interest Blank for Men*.

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FOREWORD

WITH this issue of the REVIEW we introduce what appears to be a departure in policy. Included as a supplement is a report of a Committee on the Criteria of Teacher Effectiveness.

Despite this innovation, there has been no change in the purpose and function of the REVIEW OF EDUCATIONAL RESEARCH. Our goal remains that of the periodical digest of research in various areas of education. On the other hand, there has been continuous effort to prevent the REVIEW from becoming little more than an annotated bibliography of the literature.

For this reason, the Editorial Board has urged such measures as would keep the REVIEW on a level which would contribute synthesis and perspective of research in a given area. In response to an inquiry of the membership the principle has been endorsed by the Association.

The nature of the Committee's report is such that it contributes the kind of orientation which the Board would like to see included in the REVIEW. It deals with all of the elements of research "conceptualization"—purposes, criteria, methodology. As such it is considered appropriate as a supplement to the chapters of the issue.

The decision to include it was formally made by the Executive Committee of the Association at its meeting in St. Louis on February 24, 1952. It should be noted that the supplement is a report of a committee of the Association; its subject is germane; it deals with broad problems of orientation of research in a major field; it is not the report of an original piece of research. The REVIEW in publishing the supplement has therefore not departed from its policy of not publishing original research contributions. Our purpose remains that of reviewing the research which has been published since the subject was last reviewed.

The teacher will always be a subject of educational research. This issue is thus about one of the basic topics of the three-year cycle of the REVIEW. In this issue will be found some concepts, some ideas, which have not appeared previously. It should serve students in this area in finding what has been accomplished and in exploring what remains to be done in a very fertile field of educational research.

FRANCIS G. CORNELL, *Editor*
Review of Educational Research

INTRODUCTION

IN GENERAL this issue follows the pattern set by previous Teacher Personnel numbers of the REVIEW. However, some reorganization has been attempted, consisting of the recombination of certain topics and the addition of three chapters dealing with teacher-personnel problems in higher education. Teacher-personnel research at the college level previously has been reviewed in the same chapters as similar research applying to the elementary and secondary schools. In planning this issue, the problems seemed to be sufficiently different to warrant separate discussion.

The scarcity of well designed teacher-personnel research is typical of the whole area rather than any specific educational level or topic. Much of the research that has been reported is of a descriptive nature employing observational and questionnaire technics. However, such descriptions are useful insofar as they often provide guidance and remedial data for the educational practitioner and occasionally suggest hypotheses that the researcher may test in controlled studies.

The relative dearth of significant investigations in the area of teacher personnel probably is due in part to the lack of researchers who are familiar enough with technics of sampling, control, and statistical analysis to design studies that will yield clear-cut results. Increased attention to these problems is evidenced by the appearance of such treatment as Johnson's *Statistical Methods in Research*, Jahoda, Deutsch, and Cook's *Research Methods in Social Relations*, Edward's *Experimental Design in Psychological Research*, Lindquist's *Educational Measurements*, and Parlin's *Surveys, Polls, and Samples*.

One methodological problem that has been particularly difficult for teacher-personnel researchers is that dealing with the criteria of teacher behavior. It is pertinent to note that the American Educational Research Association appointed a committee to study the problem particularly from the standpoint of a theoretical model for research that depends upon criterion data. A report of that committee is appended to this issue.

In concluding one chapter of this issue the author notes with disappointment the failure to collate research findings and provide a working plan that may be applied with confidence in educational practice. Unfortunately, much of the research in teacher personnel has been essentially exploratory, and considerable replication and study probably would be advisable before radically new departures in school practice should be recommended. Nevertheless, the point is well made; it is time research in teacher personnel was coming of age. Technics of study are available and it seems reasonable to expect that educational researchers soon should come up with procedures of known reliability and validity.

DAVID G. RYANS, *Chairman*
Committee on Teacher Personnel

CHAPTER I

The Measurement of Teacher Characteristics and Prediction of Teaching Efficiency

ARVIL S. BARR

INTEREST in the measurement and prediction of teaching success has continued to run high, with some shifts in emphasis since the 1949 summary. In addition to a number of miscellaneous studies, there has been a marked concentration of effort upon teacher-pupil relations, teacher personality, and the criteria of teaching efficiency. A variety of new instruments have appeared and some new statistical technics have been applied.

Teacher-Pupil Relations

A number of studies dealt with teacher-pupil relations, or involved pupil opinion of teacher behavior in one form or another. Leeds (15) developed a scale for measuring teacher-pupil attitudes which correlated .43, .48, and .45 with principals' ratings, observers' ratings, and pupils' ratings. Alexander (1) reported projective technics useful in predicting teacher-pupil interaction. Gage and Suci (11) found substantial agreement between student ratings of teachers and social perception scores obtained by comparing the teacher's interpretation of pupil attitudes with pupil attitudes revealed by a questionnaire. However, when the teachers filled out the *Cook-Leeds Teachers Attitude Scale*, their scores were found to be negatively, tho nonsignificantly, correlated with ratings given the teachers by their students. Michael, Herrold, and Cryan (19) found that both boys and girls overwhelmingly preferred teachers who allowed voluntary answering of questions to those who called upon specific individuals. Both preferred teachers who frequently participated in extracurriculum activities. They ranked six factors contributing to classroom enjoyment as follows: (a) teacher's methods of teaching, (b) teacher's personality, (c) confidence in the teacher's knowledge of subject material, (d) mark obtained in the course, (e) short assignments, and (f) no special emphasis on discipline. Copper (7), Long and Farley (16), Richey and Fox (25), and Riley, Ryan, and Lifshitz (26) reported upon student opinion relative to teacher behavior and practices. Their findings are similar to those already reported.

Teacher Personality

There seems to be general agreement regarding the importance of the teacher's personality in teaching success. Clark (6) reported several significant relationships between Guilford-Martin traits and annoyance-scale values. Certain types of pupil behavior were more annoying to teachers with good mental health than to those with poor mental health, and conversely other types of behavior were more annoying to teachers with poor mental health than to those with good mental health. Lamke (14)

studied both surface traits, as measured by ratings, and source traits, as measured by *Cattell's 16 Personality Factor Test*, in relation to teacher efficiency and acceptability. By use of the discriminant function he attempted to secure trait patterns that differentiated good teachers from poor teachers. The outcome suggested that there were probably several patterns of response for the good teachers and several for poor teachers. Schwartz (33) using a modified form of *Cattell's PF Test* sought new indicators of teaching efficiency from among the foundational determiners of human behavior. A regression equation composed of scores on reaction time, two-hand coordination, and the *Washburne Social Adjustment Inventory* gave a multiple R of .74 with ratings of teaching efficiency. Tschechtelin (38) found that teachers lacked appreciation of the personality traits of their pupils and of their responsibility with reference to them.

Qualities Basic to Teaching Success

Numerous attempts have been made to locate and define qualities essential to teaching success. Evans (9) provides a survey of British, American, and Canadian methods of assessing teaching ability. McCartha (17) surveyed the practices of teacher evaluation employed in the southeastern states in 1948. Powell (22) and Thiede (36) looked for traits, attributes or characteristics that distinguished teachers from other professional groups. Differences were found but whether these differences are related to teaching success remains to be established by later research. Richey and Fox (24) studied the factors influencing the choice of teaching as a vocation but the relation of these factors to teaching success must be determined by subsequent research.

Prediction of Teaching Success

Nair (20), Seagoe (34), and Schwartz (33) conducted prediction studies. The first was for industrial arts teachers, the second for graduate students of education, and the third for secondary-school teachers. The findings were generally in keeping with those of previous investigations. Using the *Minnesota Teacher Attitude Inventory*, self and supervisory ratings on the *Minnesota Student Rating Scale*, honor point ratio in professional courses, the *Miller Analogies*, and a composite ranking of candidates, Fuller (10) found low intercorrelations among the variables. The measures did not discriminate clearly between teachers ranked above average and below average. Most of the teachers were able to do acceptable college work and practice teaching. The results were not checked against inservice success. Ryans (31) reported on the relationship between certain conditions, such as teaching experience, socio-economic status of community, marital status of the teacher, and criteria of teacher behavior employed in the *Teacher Characteristics Study*.

Several new instruments have been applied to the measurement and prediction of teaching efficiency. Reference has been made to the *Cook-Leeds Teacher Attitude Scale* (11, 15), to *Cattell's 16 PF Test* (14) and

Schwartz's adaptation (33). Alexander (1) and Cooper and Lewis (8) used the Rorschach and other projective technics. Studies of rating scales were reported by Tschechtelin (37) and Hampton (12). Ryans (28, 29, 30) reported upon use of the National Teachers Examinations. The data suggest that some of these technics hold promise.

Hampton (12) attempted to obtain new insights into superintendents' ratings of elementary teachers thru statistical analyses. She interpreted high correlations between over-all ratings and (a) resourcefulness and (b) knowledge of subjectmatter, to indicate that superintendents attach special importance to these qualities. Good health, which yielded a low correlation, was believed to be taken for granted, perhaps, or, the teachers were uniformly high in this quality. Teachers were ranked highest in co-operation and loyalty, and courtesy and friendliness; they were rated lowest on knowledge of subjectmatter, general culture, resourcefulness, and speech. Discipline was the only trait for which improvement over a two-year period was noted.

Besides the instruments of measurement described above, certain statistical technics widely employed in other areas of psychological and educational research, seemed to gain in recognition and use. Some of these were: the Epsilon technic (2), factor analysis (12, 14, 32), and the discriminant function (14). Correlational and regressional technics continued to be important tools of analysis.

Miscellaneous Studies

Brown (4) found a very substantial relationship between teacher efficiency and scores on tests designed to measure application of principles of development. In another area, Celler (5) found four practices related to good discipline: (a) use of all available equipment and visual aids, (b) routinizing of various classroom procedures, (c) presentation of subjectmatter in a vital and enthusiastic manner, and (d) skilful use of technics of teaching. Martindale (18) studied a number of situational factors related to job satisfaction. Taken singly none showed a significant relation to teaching success altho several yielded positive correlations. Nance (21) found that masculinity-femininity scores, as measured by the *Guilford-Martin Inventory*, the *Strong Vocational Interest Blank*, and the *Minnesota Multiphasic Personality Inventory*, differed for the two sexes and teachers of different subject fields, but the scores were not correlated with teaching success.

Criteria of Teaching Effectiveness

There appears to be a growing concern about the criteria of teacher effectiveness. Symonds (35) recorded his reflections based on observations of 24 teachers. Jensen (13) reported technics employed by the *Teacher Characteristics Study* in attempting to identify critical teacher behaviors. Beecher (3) presented a summary of his findings and thoughts upon teacher evaluation. The University of the State of New York (39) issued

a 57-page bulletin on standards and procedures recommended for teacher evaluation. Ryans (27) provided an analytical discussion of the criteria of teaching effectiveness. Remmers, Elliott, and Martin (23) found little agreement regarding criteria. The American Educational Research Association thought the matter important enough to appoint a special committee on "criteria of teacher effectiveness." (See Supplement to this issue of the REVIEW.)

Needed Research

In conclusion, attention is called to certain unsolved problems in the area of teacher characteristics.

1. No one appears to have developed a satisfactory working plan or system that can be used by personnel officers who must make judgments about teacher effectiveness.

2. Little has been done in evaluating the nonclassroom responsibilities of the teacher—his activities as a friend and counselor of pupils, his activities as a member of a school staff, his activities as a member of a school community, and his activities as a member of the profession.

3. Very little has been done in differential measurement and prediction. Concern seems to have been chiefly with the general merit of teachers. Administrators often need teachers with special abilities.

4. Teaching effectiveness generally has been treated as something apart from the situations giving rise to it. More needs to be known about the situational determiners of effective teaching.

5. Much of the research on teacher effectiveness seems to proceed as if the qualities in question resided entirely in the teacher. This may or may not be true. "Teacher effectiveness" may be essentially a *relationship* between teachers, pupils, and the other persons concerned with the educational undertaking, all affected by limiting and facilitating aspects of the immediate situation.

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CHAPTER II

Selection, Guidance, and Preservice Preparation of Students for Public-School Teaching

LAURENCE D. HASKEW*

A SHARP decline in research productivity was apparent in the three-year period covered by this review. Chief cause was the absence of large-scale investigations and cooperative studies, and the cessation of state survey activity that was prevalent immediately after World War II.

However, some impetus was given to the publication of research materials dealing with this field by the launching in March 1950 of the quarterly *Journal of Teacher Education*, published by the National Commission on Teacher Education and Professional Standards of the National Education Association. Also, it should be pointed out that the total literature on teacher education was more abundant during the period covered by this review than in any other comparable period and that the practices and procedures of teacher education were subjected to increasingly critical discussion. While much of the discussion, criticism, and antagonism was based upon successful experience and authoritative opinion, the accumulation of research evidence upon crucial issues in teacher education proceeded at slow pace.

The American Association of Colleges for Teacher Education continued its series of yearbooks (3, 4, 5), and the Association for Student Teaching also published three yearbooks (8, 9, 10). The American Council on Education published a two-volume report of the College Study in Intergroup Relations (20, 21).

Methods of Investigation

More than one-half of the studies reported were based upon questionnaire surveys of current practice. Approximately one-fourth used expressions of opinion gathered by a checklist type of instrument as their basic data. A very small number of investigators employed tests or other objective-type measuring instruments to collect data and statistical technics to interpret the data gathered. One study (20) employed the analysis of process as reported by on-the-spot recorders and trained observers. No investigation was reported that employed controlled experimentation as the major research technic.

Selection and Guidance of Students

The student-personnel practices in 123 member institutions of the American Association of Colleges for Teacher Education were summarized

* The writer is indebted to Mr. Edwin Hindsman, research assistant, for valuable contributions to this chapter.

in an important publication (6), which also presented details of practice in certain selected institutions. Selection at time of admission was exercised chiefly by general college regulations regarding quality of preparatory work, but a significant percentage of the institutions employed rating scales, placement tests, and personal interviews to screen out certain applicants. Guidance for the prospective teacher was typically a joint responsibility of teachers in professional education courses and a central counseling bureau. Most respondents expressed dissatisfaction with the existing arrangements for student guidance. Selection was usually described as a continuous process, closely allied with guidance, with critical points appearing at the time of admission to student teaching and at the time of final recommendation for certification. The employment of prognostic measurements of students was not common, but a significant percentage of institutions reported that personality measures were being collected and used in counseling.

Richey and Fox (45) used an anonymous questionnaire with 1615 University of Indiana students, chiefly freshmen, and found that younger students from rural small town areas, whose parents were in lower-income brackets and were laborers or school teachers, chose teaching as a career more often than did their opposites. Most of the students included had not selected any vocation, and misinformation about teaching as a career was prevalent. Byers (19) and Orleans and Finkelstein (43) made questionnaire surveys of recruiting practices, finding that special attention to recruiting was not common.

Bases for screening students continued to attract investigative attention. Lawson (33) reported that in 237 teacher-educating institutions only 42 had systematized, regularly used plans for the employment of character "traits" as a selective measure, and only 11 rated their plans as significantly valid. Almost no students were eliminated from preparation programs on character-personality bases. Similar findings were reported by Johnson (29).

Michaelis and Tyler (40, 41, 48), using 54 women students as subjects, compared scores on subtests of three standardized personality measures with success in student teaching as measured by college supervisors' ratings. Only three significant coefficients of correlation were found, all low, and the general conclusion was that the subtests had little selective or predictive value. Fuller (22) reached similar conclusions in regard to other objective measures. Nance (42) reported a very slight leaning toward femininity by teacher-preparation students compared with test norms, but gave no indication that the tests had selective potentiality.

The Curriculum

McGrath (38) reported that 90 percent of teacher educators whose opinion he solicited thought that preservice programs had not actually improved in the past 10 years. Seventy percent of the respondents thought

that more than four years were required for an adequate preparation period. Most of them strongly favored what the author called "newer practices in teacher education." Isbell (28) and Allman (2) reported evidence that teachers colleges were broadening their offerings in general education. Reynolds (44) found a significant increase between 1938 and 1947-48 in enrolments in courses in generalized science, and a trend toward requiring these courses.

Investigations of the current status of offerings in Philosophy of Education, Principles of Education, and Introduction to Education were made by Brinkley and Jordan (17) and McGrath (35, 37). The authors reported a lack of standardized content, great variety in course emphasis, and widely divergent objectives. Luker (34) used a jury of 256 classroom teachers, supervisors, and administrators to judge the importance of topics in educational psychology. Topics dealing with child development, mental hygiene, personality development-adjustment, and efficiency in learning rated highest. Theories, history, experiments, and schools of psychology were the topics rated lowest. Grossnickle (25) reported a trend toward the disappearance of college courses in arithmetic and general mathematics as well as of courses in special methods for teaching arithmetic. Alberty (1) found that only three of 34 leading institutions preparing secondary-school teachers had stated programs for preparing teachers to do "core-curriculum" work.

A survey (14) of the opinions of 1100 California high-school teachers disclosed that in a list of 23 factors contributing to success in teaching, courses in education were placed sixth from the bottom. Education courses were rated as making slight contribution to the development of competence in planning, organizing, and directing classwork; as making limited contribution to the understanding of children; as making high contribution only to an understanding of the social setting of education and the purposes of the secondary school. Thacker and Read (47) reported that high-school mathematics teachers gave high rank on preparation value about equally to courses in education and courses in mathematics. Sterner (46) and Beck (11) compared the activities of beginning teachers with the college curriculum offerings available and found several discrepancies, particularly in the fields of the extracurriculum and community services. Boutelle and Mead (15) discovered that little or no attention was given in 81 colleges to developing library-use skills by student teachers.

Intergroup Relations. Two volumes edited by Cook (20, 21) comprised a detailed report on the College Study in Intergroup Relations. A variety of methods was employed by each participating college in attempting to bring about curriculum changes that would be conducive to the development of better intergroup attitudes on the parts of prospective teachers. Several new measuring instruments were developed, and guides for college surveys of intergroup relations were produced. Contact with the community and involvement in community problems seemed to be the most productive

means for changing attitudes on the parts of both students and faculty. The processes involved in the various college studies were thoroly analyzed in the reports, and altho no definitive conclusions were reached several hypotheses concerning the nature of curriculum changes were set forth as being indicated by the data collected.

Evaluation. As pointed out in preceding sections, the typical evaluative investigations employed the opinions of teachers in service or the activities engaged in by teachers as the means for arriving at judgments on the effectiveness of college curriculums. A few investigators (13, 26, 30, 39) attempted other means of evaluation. Klausmeier and Swanson (30) devised means for evaluating a course in educational psychology by rating the performances and production of students in real-life situations. Mallinson (39) reported that test results revealed that college curriculums for science teachers were not producing the desired comprehensive knowledge of all fields of science.

Student Teaching and Internship

Studies concerned with various aspects of student teaching (7, 10, 12) revealed the following trends: (a) lengthening the period and expanding the daily time devoted to student teaching; (b) steadily increasing use of off-campus schools as student teaching centers, with campus schools becoming almost exclusively centers for observation and demonstration; (c) college supervision of students increasingly provided by generalists rather than by subjectmatter or grade-level specialists; (d) little attention to outside-classroom experiences for student teachers; (e) diminution of other college work taken concurrently with student teaching, altho typical practice was still that of student teaching comprising only part of the student's course load.

A survey (10) of 125 member institutions of the American Association of Colleges for Teacher Education revealed that opportunities for readiness experiences prior to student teaching were rare, with admission to student teaching being largely automatic upon completion of prerequisite courses. A tendency existed for the off-campus student teaching to be done in communities larger than those in which first employment was found. The typical institution used six to 10 cooperating school centers each semester, located quite near the college campus. Eighty-nine percent of the institutions provided some kind of financial or recognition award to the cooperating school or teacher.

Internship, as contrasted with student teaching, should consist of full-time work in a school position, and be characterized by intensive experience in planning, in conducting extracurriculum activities, and in preparing materials, according to a jury of authorities (12).

Other Investigations

Of a sample of 141 state-supported teachers colleges in 1950, 25 percent had dropped "Teacher" from their names, 75 percent offered general-

purpose degrees, and 50 percent offered the master's degree (27). Another similar study (32) confirmed these findings.

McGrath (36) reported the results of a checklist inquiry into the status and duties of the Director of Student Teaching. Koos (31) concluded that the typical curriculum pattern for preparing teachers for community colleges was only slightly different from that currently employed for preparing all secondary-school teachers.

Reviews of literature were furnished by Brickman (16) and Butler (18). The *Elementary School Journal* published two annotated bibliographies on teacher education (23, 24). The Association for Student Teaching provided an annotated listing of films suitable for teacher education (9).

It has been impossible to include in this review the descriptive accounts of practices, curriculum revisions, and future plans for individual institutions. Such accounts constitute evidence that the education of teachers is in a state of considerable flux and is receiving more attention than the research reported would indicate.

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CHAPTER III

Certification of Public-School Teachers

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IN REVIEWING the current literature relating to teacher certification, both the bibliographical and evaluative approaches will be employed with the intent of suggesting directions for future research as well as illustrating what is now being done.

The main problems dealt with by studies covered in this review had to do with current requirements and practices followed in the certification of teachers. This question of the present status of teacher certification is, of course, of vital importance both to those who are members of the teaching profession and to students in teacher training. The academic and professional requirements set up by state and regional authorities determine this status, and if the certifying authorities neglect to define the requirements clearly, as frequently is the case, this inadequacy is reflected in uneven teaching standards and leads to a general weakening of the educational structure.

Certification Requirements and Practices

Periodically issued statements from state departments of public instruction and regional educational accrediting associations serve as the main sources or agencies of teacher certification requirements. The information contained in such bulletins during the past three years was presented in digest form annually by Woellner and Wood (21, 22, 23) and published at intervals by the U. S. Office of Education (1).

Studies concerned with reasons behind certification requirements and the authority to issue state certification regulations have been made. McDonald and Stinnett (11) summarized the essential purposes of certification and Woellner (20) outlined the progress that has been made in defining the authority responsible for issuing certificates.

There have been fewer investigations of certification in special teaching fields during the past three years than in previous periods. Health education and athletic directors' professional requirements were, however, appraised by Stafford (16); goals of certification in business education were re-emphasized by Jackson (6); and efforts to raise the level of science teaching received support from Mallinson (13).

Two studies of the certifying functions of professional associations dealing with school counselors have appeared. Kremen (9) reported on the over-all position of the counselor, and Speer (15) on the psychologist's position with regard to both individual practitioners and counselors employed by public-service agencies.

McQuagge (12) of Mississippi, Osborn (14) for Iowa, Viall (17) of New York, and Walker (18) in Texas examined the activities of the state

certification officer with regard to advising and interesting teacher personnel where their professional status is concerned.

The status of emergency certification has been reported by Bowers (5) who defended the practice in Ohio schools and Johnson (7) who instructed California teachers on their legal rights when holders of emergency certificates threatened to infringe on seniority and quality.

Interstate Reciprocity in Teacher Certification

Reciprocity in teacher certification, altho more generally discussed than practiced by the states, has gained ground and seems to be more than a distant and future ideal. Most important, the implementations of interstate certification have high-lighted not merely the question of adjustment between state law and educational theory and practice, but also the growing respect for the teacher-training institutions and the credentials of their graduates. In addition to reviewing the challenges in reciprocity, Bowers (4) catalogued its merits and difficulties and Woellner (20) reported the trend.

Teacher-Education Courses and Certification Requirements

Some research was initiated in the problem area of inadequately defined academic and professional course requirements in the official statements regarding teacher certification; this, despite sensitive attitudes such as that expressed by Klonower (8) who stated that any criticism of certification constitutes an attack on the curriculum standards of teacher training.

Werf (19) studied the reactions of educators and administrators to proposals for a broader academic program, more classroom apprenticeship, and a possible Doctor of Education degree for all teaching personnel. Similar problems were explored by Bordelon (3) from the standpoint of elementary-school education. Ball (2) concentrated on opinions regarding the restriction of certification to major and minor teaching subjects. Those polled indicated preference for a broader conception of their work. McCutcheon (10) indicated that many adjustments between the special concerns of the normal school and those of graduate education appeared inevitable.

The fact that these important questions of specificity and definition of academic and professional courses have been raised is an indication of progress. Certification procedures have been instituted in order to improve the likelihood of uniformly competent instruction to the children attending American public schools. To the extent the requirements can be spelled out and made unequivocal will this goal be realized.

Summary and Critique

Recent researches dealing with teacher certification are typified by status-study reports. Reports of current practices necessarily have only momentary significance. They soon become obsolete in a changing society and often have as their justification nothing more than the weight of

authority; authority that sometimes seems to lack consistent and valid bases supported either by research or experience. Yet, studies that reveal present status and interpret trends are important for educational thinking and planning.

Perhaps research in teacher certification must remain in the realm of status study, the more basic research dealing with the requisites for effective teaching being conducted in the related area of teacher training.

But whatever the source of the evidence, it seems apparent that teacher-certification requirements need to be validated, and to be carefully defined and clearly stated. As an example of the ambiguity that exists at the present time, the frequently appearing certification requirement relating to course work in educational psychology may be cited. A study of what certification authorities really have in mind when they require a given number of semester hours credit in the field would not only appear appropriate, but would shed much needed light on the relationship between actual curriculum content and the requirements of the teaching certificate. Neither the teacher-training center nor certification agencies state in any detail what concepts in educational psychology a student should master, or even be on acquaintance terms with, to assure minimum competence as a public-school teacher. What is true of educational psychology is also true with regard to most certification requirements. This represents a genuine challenge to fundamental research in the related fields of teacher training and teacher certification.

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CHAPTER IV

Employment Practices in Elementary and Secondary Schools

ARTHUR L. BENSON

DURING the period covered by this review, research on employment practices was primarily devoted to analyses or descriptions of current status. Questionnaire studies and descriptive reports of local practices dominate the literature. Relatively few reports have been concerned with evaluation of these practices or with the development of new technics.

Considerable attention has been given to special statewide recruitment and training programs to meet the elementary-teacher shortage. The long-range effect of these programs on the relationships between state and local school systems and training institutions is not yet apparent altho it is evident that, for elementary teachers, local selection practices have been affected. Greater emphasis on recruitment of prospective teachers by local secondary schools is also apparent. A large portion of articles on recruitment and substitute teachers which appeared in the journals has been entirely hortatory or prescriptive in nature and has been omitted from this review.

Research on the topics included in this chapter was reviewed for the period 1946-1948 by Archer (4) and Ryans (32). General summaries of research in these areas were made by Anderson (2), Archer (5), Barr (6), and Sanford and Trump (34). Domas and Tiedeman (12) prepared an annotated bibliography of major research studies in teacher competence, including indexed references to employment practices and to specific methodologies.

Teacher Recruitment

Beecher (7) studies the effectiveness of the New York State recruitment and training program for alleviating the elementary-teacher shortage. During the first three years of operation, approximately 1200 college graduates recruited for the six-week Intensive Teacher-Training Program had completed one or more summer sessions, and the potential supply of elementary teachers available from the regular four-year program was increased by 40 percent. Beecher also compared the teaching effectiveness of special trainees with regular four-year graduates. Representative samples of 100 beginning teachers were drawn from both groups. Ratings of teacher effectiveness were made by a team of experienced supervisors using two rating devices in addition to their own general appraisals. Year-end ratings indicated that the proportion of special trainees rendering average service was only slightly less than that of regularly trained teachers. However, the proportion of special trainees doing relatively superior work was only about one-third of that for teachers with four-year training. Approximately 10

percent of both groups was judged "complete failure." Special note was made of the fact that 84 percent of the trainee recruits had training or experience in education prior to participation in the program: Beecher concluded that the teaching effectiveness of trainees in their first year of teaching was below that of regularly trained teachers altho not sufficiently inferior to jeopardize the welfare of children in schools.

Engleman (13) and Herge (19) described the special recruitment and training program in Connecticut. Of approximately 350 recruits who applied in 1949 for the special eight-week training program, 222 were accepted and 217 completed the program and were recommended for special certification. Selection of recruits was based on age, physical fitness, poise and appearance as demonstrated to interviewing committees, and mental ability as demonstrated by college transcripts or tests. Herge (19) reported that 157 June graduates of liberal arts colleges began teaching in September after completing the workshop and that most of these completed six semester hours of additional training during the ensuing academic year.

Bases for selection of recruits in Ohio varied considerably from those in New York and Connecticut. Bowers (8) listed four factors considered as: (a) possession of an Ohio secondary certificate issued on recent graduation, (b) sincere interest in children of elementary-school age, (c) breadth of preparation, and (d) high scholarship. Some evaluation of the results of this recruitment program was implied by modifications made in it. Issuance of standard elementary certificates after completion of 18 semester hours was changed so as to require completion of 30 semester hours, and validity of certificate was limited to Grades IV-VIII. Bowers reported that three out of four teachers in the program would prefer secondary teaching.

At the local high-school level, Byers (9) attempted to assess the status of recruitment for elementary teachers on the basis of questionnaire replies received from 313 schools in 38 states; 260 of the schools were in California. The counselor was named most frequently as the person having responsibility for recruitment program, and incentives emphasized were in accord with research findings on motivation toward the profession. Reasons most often given for not recruiting were: (a) feeling that the profession does not command respect and (b) belief that recruitment is not a responsibility of the local high school. Frequency with which these schools used various recruitment technics was also investigated.

Attitudes of Massachusetts high-school seniors toward teaching were investigated by Graves (16). Questionnaire replies received from 1036 students, all in the top quarter of their class, revealed that nearly 46 percent of this group had rejected teaching as a career after definitely considering it. Most frequent reasons given for rejection were that (a) teaching is not interesting enough and (b) chances for advancement in the profession are small.

Some attention has been given to the recruitment of teachers for handicapped children, Orleans and Finkelstein (27) found that 13 of the 20

large city school systems included in their survey reported a serious shortage of teachers in this field. On the basis of recruitment practices reported by these cities, the authors concluded that a \$100-\$200 salary differential appeared to be relatively ineffective and suggested provision of special training for undergraduates rather than the common practice of recruiting primarily from regular teachers. Factors influencing special education teachers to go into this field were studied by Lord and Wallace (23). Questionnaire replies from 406 special education teachers in 33 schools led to the conclusion that the single most important factor in recruitment was the provision of opportunities for prospective teachers to have direct experiences with handicapped persons.

Teacher Selection

The most comprehensive contribution to the literature on teacher selection during the period covered by this review was the monograph published by the American Association of Examiners and Administrators of Educational Personnel (1). This publication was designed to serve primarily as a reference book for local school officials with responsibilities for teacher selection. It includes chapters on the history of the merit system in teacher selection, principles of teacher selection, recruitment, examination announcements and application procedures, eligibility requirements, written examinations, nonwritten examinations, eligibility lists, probationary performance, and public relations in teacher selection. Individual chapters vary considerably in treatment. Some are expository; others summarize published research; and a few cite research findings, particularly with respect to local practices, which are not generally available. To facilitate its use as a handbook, the monograph includes samples of forms, scales, regulations, and other materials used by local school systems in carrying out teacher-selection procedures.

The major portion of the monograph deals with procedures for implementing the following theses: (a) insofar as objective, quantifiable, and recordable evidence of merit and fitness are available, this evidence should be used in lieu of subjective judgments; (b) subjective judgments should be used to appraise those qualifications for which objective evidence cannot be obtained and every effort should be made to enhance the reliability of these judgments; (c) teacher selection is a long-range process, beginning with the recruitment of high-school students for teacher preparation and continuing thru the period of probationary teaching; (d) appraisal of merit and fitness should be the responsibility of professional officials and adequate safeguards to protect their prerogatives should be established; (e) minimum standards of preparation and experience for each position should be established; (f) applicants should be appointed from eligibility lists; and (g) the plan for teacher selection adopted by a local community should be widely publicized.

Several surveys of current practices in teacher selection have been re-

ported. On the basis of replies to a questionnaire circulated to a stratified sample of 320 city school superintendents and 100 teachers college presidents, Ryans (28) concluded that relatively little attention was being given to teacher-selection procedures. Ryans divided frequently mentioned teacher qualities into three categories with respect to the probable validity and reliability with which these qualities could be estimated at the time of selection. The quality mentioned most frequently by respondents as being evaluated in teacher selection was "personality," a quality in the most dubious category. Among other popular responses, health and physical vigor, educational background, appearance, and scholarship were judged to be amenable to relatively good estimation; teaching skill and liking for children were judged to be estimated with less assurance; and character and cooperation were considered to be amenable to relatively poor estimation. Ryans reported that his study had failed to reveal the use of other than traditionally unreliable practices in teacher selection.

Hardaway's survey (17) of 131 city and county superintendents in Indiana also revealed that "personality" was the most popular factor considered in the selection of beginning teachers. Other factors considered important were the critic teacher's evaluation, letter of recommendation from faculty, total academic scholarship, and major subject scholarship.

Kroll (21) reported on the relationship between performance in teaching business subjects and factors considered by the New York Board of Examiners. Factors emphasized were: (a) sympathetic understanding of the behavior patterns of children, (b) readiness to serve less able students, and (c) potentiality for professional growth and expanding service. Fields (15) described the procedures used in New York for selecting both teachers and supervisors of classes for mentally retarded children.

Technics for teacher selection were also investigated. Ryans (30, 31) analyzed the values of the National Teacher Examinations in local selection of teachers. These included (a) the provision of a common scale for evaluating professional preparation which was independent of institutional variations in standards and marking practices, (b) the maintenance of consistent selection standards from year to year facilitated by the equating of annual forms of the examinations, and (c) the improvement of teacher assignments made possible by comparable estimates of a candidate's preparation for several assignments. In a separate study Ryans (29) described procedures for preparing qualifications profiles and eligibility lists so as to combine National Teacher Examinations results with other scores or ratings.

Chauncey (10) reported on the increased use of the National Teacher Examinations, and changes in this program to permit administration of the examinations in a single day without substantial reduction in the knowledge and abilities measured by the tests. The provision of examinations to aid four school systems in selection of principalship candidates was also noted.

Various aspects of the use of the interview in teacher selection were reported. Clarke (11) described the types of questions used by oral examination committees in Chicago to evoke responses which assisted the committees in evaluating qualifications not measured by written examinations. Fields (14) proposed the use of group-interview technics for the same purpose. The use of teacher committees to screen applications and conduct initial interviews was described by Mintzer (26).

Several studies were directed at the identification of factors contributing to teacher effectiveness. Making use of criteria and instruments developed in the Teacher Characteristics Study, Ryans (33) investigated the association of selected professional and personal data with these criteria of teaching effectiveness. Observation of 275 third- and fourth-grade teachers in four communities revealed little or no relationship between these criteria and (a) school system in which the teacher was employed, (b) socio-economic status of neighborhood served, (c) marital status, (d) amount of college training, (e) agreement with principal on educational viewpoint. Teachers with 5-9 years of teaching experience were judged more effective than those with either more or less experience. Significant results were also obtained for the "dominant," "impulsive," and "sociable" scores on the Thurstone Temperament Schedule.

In a study of 32 beginning high-school teachers, Lamke (22) selected 10 best and eight poorest teachers on the basis of the teacher's acceptability to his principal plus confirmation by expert opinion of teaching performance. Each teacher was rated on Cattell's surface traits and given Cattell's 16 Personality Factor test. Study of the data revealed no well defined different patterns for these presumably extreme groups. Lamke concluded that so far as the personality traits measured were concerned, good teachers were good for different reasons, and poor teachers poor for different reasons.

Havighurst (18) considered personality characteristics of teachers in relation to mental health of children. He proposed that the effective teacher should (a) be reasonably outgoing toward the social world around him, (b) give as well as receive in his relationships with others, (c) be relatively easy in his demands on himself, (d) have a permissive attitude toward merely unconventional behavior, (e) have a strong moral sense and positive convictions, (f) have insight into his own personality, (g) look for the best in people. Havighurst expressed the belief that the identification, measurement, and development of desirable personality characteristics for teaching define an area of research of great importance among educational problems, but very nearly last place in the amount and quality of research done.

Placement

Two surveys designed to throw light on sources of satisfaction and dissatisfaction with placement were reported. Martindale (24) followed up 72 beginning teachers with a questionnaire which he scored to obtain

an index of placement satisfaction. The correlation between satisfaction scores and supervisors' ratings was .19. Altho 100 factors were identified as stimulating variable responses from his respondents, Martindale concluded that the data usually available on prospective teachers provide no firm basis for predicting placement satisfaction. Kline (20) analyzed responses to a questionnaire on satisfactions and annoyances in teaching which he administered to 100 teachers attending summer school with similar results.

On the basis of his efforts to compare the results of follow-up surveys made of graduates of teachers colleges during three different periods, Andruss (3) proposed specific improvements in methodology for conducting such studies.

Substitute Teachers

As in the case of teacher recruitment, much of the literature on substitute teachers consists of general advice and encouragement. The description (25) of a comprehensive program in one school system for improving the quality of substitute teaching is worth noting. Also of interest are procedures adopted by one city (35) for employing substitutes on a full-time basis.

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CHAPTER V

Inservice Education of Elementary- and Secondary-School Teachers

J. CECIL PARKER and WILLIAM P. GOLDEN, JR.

Current Trends

THE number of articles appearing in educational literature is testimony to the increasing interest in inservice education. However, the amount of research dealing with inservice education is quite limited during the period covered by this chapter. True, there is the beginning of a trend toward more objective research. The majority of literature published in educational journals consists of expressions of opinion about various inservice techniques or descriptive reports of inservice programs developed at local, county or state levels. Research reports and adequate descriptions of processes and techniques are rare.

Several comprehensive surveys of the extent and effectiveness of inservice education programs were made during the period. The surveys relied upon the questionnaire as the major data-gathering device. The California Teachers Association (9) reported a statewide survey of inservice education in California school districts with reference to four areas: (a) budgetary provisions, (b) organization and administration, (c) evaluation of inservice education programs, and (d) problems and needs. As an outgrowth of this survey, the California Teachers Association prepared a handbook on inservice education (10) which includes ideas and suggestions on the organization, administration, and evaluation of inservice education programs; and descriptions of some of the practices found in California school districts. Wood (43) directed a similar statewide survey of inservice education in Oregon. The data reported consist of (a) teacher opinions on their general competency, (b) suggestions for improving competency, (c) estimates of time devoted to inservice training, (d) teacher evaluations of inservice procedures, (e) analysis of group differences in regard to the previous categories. Jardine (19) sent a questionnaire to 38 school systems of various sizes throughout the country in order to determine the status of inservice education. Altho his sample was small, the findings are similar to those reported by the California Teacher Association and by Wood.

The workshop continues to be the most popular form of inservice education. Over 200 articles dealing with the workshop were reviewed in preparing this chapter. Anderson (2) reviewed the history of the "movement," and used his 10 years' experience with workshops and analysis of his associates' opinions to develop a list of 10 criteria for an effective workshop. Kelley (22) described the principles, purposes, and procedures

of the workshop way of learning as these have been evolved over the last 10 years at Wayne University. This report constitutes one of the few longitudinal studies of workshop procedures available in the literature. Stafford (41) analyzed the administrative problems involved in utilizing the workshop as the primary means of inservice education.

Group Dynamics and Action-Research in Inservice Education

Evidence of the growing recognition of the power of the group as an influence on learning has stimulated efforts to apply the findings of group dynamics to inservice education programs and procedures. Barnes (4) pointed out the implications of group dynamics for improving the effectiveness of staff operation at the local level. The literature on group behavior and human-relations training and its significance for adult education was reviewed by Bradford (6). Haan (17) described the typical course in supervision offered at universities as lacking in reality, and proposed that teachers taking such courses be given opportunities to learn human-relations skills thru actual participation in group problem-solving. Lippitt and Bradford (24) dramatically suggested ways of making the typical two-day fall institute more productive by organizing small work groups around problems of concern to the teachers. At the graduate level Patterson (36) criticized college teaching in education seminars as teacher-centered and proposed five conditions for effectively using group processes in graduate seminars. As one facet of the Illinois Secondary School Curriculum Study, Benne and Muntyan (5) edited a selection of readings on group development and "human engineering." This collection of readings is one of the best source books on the central importance of the "human factors" necessarily involved in curriculum change and in inservice education. Parker (32, 33) pointed out certain conditions which are necessary for effective group processes and indicated the role of problem-centered groups of staff members in improving school programs. There has been an increasing interest in the influence of attitudes on changing teacher behavior. Southworth's article (40) is representative of efforts being made to identify the problems involved in creating attitudes favorable to planned social change in education.

Other disciplines have recently explored the role of the group as a "change agent" and have utilized action-research technics in inducing and evaluating change. Application of action-research procedures to educational problems is recommended by Wrightstone (44). His article defines and illustrates six major characteristics of action-research. Corey (12) stated the differences between action-research and fundamental research while pointing out the potentiality of action-research for involving those to be affected by curriculum change in the processes of "planning, executing, and evaluating." Recent action-research projects in inservice education are those reported by Lippitt (23), Lippitt and Jenkins (25), Cunningham and others (13), and Bush (8). Thelen's progress report (42) from

the Human Dynamics Laboratory of the University of Chicago described the conceptual framework and research methodology being evolved to guide the various inservice activities conducted by the laboratory. This report constitutes a contribution to research workers in the field of group dynamics, action-research, and inservice education. It demonstrates the role which theory plays in action-research, contains an extensive evaluation of technics for collecting data on interaction in groups and offers many clues for setting up research designs in inservice education.

Cooperative Studies in Inservice Education

The development of collaborative working arrangements between elementary and secondary schools and institutions of higher learning for purposes of stimulating inservice growth continues to be a growing trend. Jordan and Goodlad (20) wrote a progress report of the Atlanta Area Teacher Education Service—an inservice venture in which six institutions of higher learning, three county school systems, and three city school systems pooled their resources. Osborne (31) developed a Preferential Training Needs Record for determining the inservice training needs of teachers participating in the Atlanta Area Education Service and compared these needs with the training experiences which college instructors, and local administrators felt the teachers needed. The data indicated that, in general, there is lack of agreement between teachers, college instructors, and administrators concerning teachers' needs and the relative importance of training in certain areas. Child study programs developed in collaboration with university staffs or institutes have been established in many school systems. Characteristic of these programs are those reported by Hufstедler (18), Kawin (21), Anderson (1), and Perkins (37).

Evaluation of Inservice Education

Evaluation of inservice education continues to pose many problems. Recently reported studies are marked by the effort to secure factual, objective, descriptive data before, during, and after the inservice experience. The methodology of evaluation is moving away from the collection of testimonial evidence to securing objective data by means of interviews, observation, case studies, projective technics, sound recordings, open-ended questionnaires, and attitude surveys. Rice (39) analyzed the nature of workshop evaluation procedures characterizing workshops held during the last decade and proposed some criteria for evaluation. Parker (35) described the frame of reference used as a guide in the research studies of the California Cooperative Study of Inservice Education, as well as the difficulties involved in securing "before, during, and after" data. Some six studies of the California Cooperative Study of Inservice Education have been reported. Michell (29) evaluated the effect of participation in a summer workshop on selected classroom practices. Evaluative data were gathered at three points: before the workshop via interview of a sample of 50 teachers and their principals, and classroom observation; during, by

logs, diaries, pencil and paper instruments; after, by follow-up observations and interviews. The difficulties encountered by teachers in attempting to change instructional methods were analyzed by Long (26). Fifteen teachers interested in trying to utilize group procedures in their classrooms met five times during the term to exchange ideas and discuss difficulties encountered. Tape recordings of the group meetings were analyzed to identify clues as to kinds of assistance the teachers needed and to discover the nature of blocks to change. Long's study pointed out that there is considerable difference between the problems teachers expect to encounter and those actually encountered. A comprehensive evaluation design was employed by Parker (34) to evaluate the Alameda, California, Mental Health Institute. All the participants were interviewed prior to the institute; recordings were made of work group sessions, staff orientation sessions, and evaluation sessions; all the participants completed several "free-response" inventories during the institute; and a series of follow-up interviews of the participants were held six months after the institute. The assessment showed considerable change in the perceptions, ways of working, and attitudes of the participants. McNassor's study (28) of what happened to the workshop intentions of some 74 teachers, who had attended a campus workshop, after they had returned to their jobs indicated that workshop experiences often create conflicts. Data for the study were obtained by (a) detailed statements of intentions, and anticipated blocks to teaching differently, written at the close of the workshop; (b) statements by each person of incidents illustrating what the transition from workshop to job had been like (written in the fall); (c) group discussion and individual interview material secured at a two-day follow-up conference held six months after the workshop. Golden (15, 16) explored the use of sociometric technics as a means of discovering patterns of human relationships on faculties, and as a way of organizing faculty committees. In order to ascertain whether or not sociometric structuring of committees made for better interpersonal relations and more effective committee processes, he observed the group processes of several inservice committees which had been organized in different ways. Sociometric study of school faculties indicated that the choice patterns of faculties were similar to those identified in other situations. Inservice committees organized in terms of choice were found to be characterized by (a) more even member participation, (b) higher volume of member participation and a lower volume of leader participation, (c) more "group-centers" and less "leader-centered" interaction, (d) less difficulty with problem-solving processes than the conventional administrator-appointed committees.

The trend toward more objective evaluation of inservice education is evidenced by a number of other research reports. Anderson (1) sought to discover the changes in teacher attitudes, understandings, and classroom behavior occurring as the result of participation in a cooperative type of inservice education. He secured "before-after" data via the Purdue

teachers examination, a school practices questionnaire, and classroom observation on two groups of teachers, one of which had participated in an experimental cooperative inservice program. While the experimental group made numerically higher scores on all the instruments, few statistically significant changes were found between the experimental and control groups. A questionnaire was used by Pockrus (38) to evaluate the Corpus Christi, Texas, child study program. Over 84 percent of those responding indicated that the experience had been of value to them. In attempting to validate Rath's "needs theory" Burrell (7) designed an inservice program aimed at helping teachers to identify symptoms of emotional needs, and to develop procedures for meeting the needs. She secured data on the teaching-learning situation of six teachers and their classes before and after the inservice program. The results indicated that application of the "needs theory" facilitated learning, and improved social relationships. Fleming (14) carried out a similar study with teachers of children with psychosomatic illness. The inservice program designed to increase teachers' sensitivity to emotional needs was found to decrease the intensity and frequency of psychosomatic illness in children to an extent significantly greater than occurred in a control group. Lippitt's evaluation (23) of the effects of training in a workshop on community relations showed changed behavior in a number of categories ranging from 60 to 100 percent of the delegates. The research design for this study was of the "before, during, and after" type. Extensive data on participants' needs and problems were gathered before the workshop by interview of the participants and their co-workers; detailed data during the workshop were obtained by group process observers; follow-up interviews of all participants and some of their colleagues were made after the workshop.

Coffey and Tiffany (11) in a follow-up study of a six-week summer workshop found that commitments made in such a setting were carried over into action in the classroom, school, and community. Perkins (37) reported that the socio-emotional climate under which inservice education occurs is a major determiner of the quality and quantity of group learning. He studied six groups of teachers involved in a child study program, three of which were near the extreme of "leader centeredness" and three near that of "group-centeredness" as identified by Withall's technic. "Group-centered" groups were found to differ significantly from "leader-centered" groups in group learning and group interaction. The evaluation of administrative services was employed by McClintock (27) as an inservice technic. The principal and teachers developed an evaluation form which was used to rate administrative services of the administrative staff at the beginning of a term and again at the end. The technic was found helpful in broadening the teachers' concept of administration as well as in aiding the staff to improve administrative services. Newcomer (30) studied the effects of a series of informal meetings held by a principal and his staff biweekly in private homes. The group met to discuss the behavior of children and class-

room problems. Written reactions to hypothetical classroom situations before and after this inservice experience, as well as interviews, were used to secure evaluative data. The study revealed considerable modification in practice, problems, and attitudes after the inservice experience. Bard (3) evaluated the effect of community study experiences on teaching relationships with students, faculty members, and parents.

Summary

In the midst of the volumes of inspirational literature written about inservice education there are few research articles reported. The literature reviewed, however, indicates that more attention is being given to a critical, objective analysis of the effectiveness of particular inservice technics. The studies reported are evidence of the practicality of evaluation. The trend away from testimonial evidence marks a high spot in research on inservice education. The future challenge to research is great. Research is needed on the effect and influence on inservice education of such things as: leadership styles; the process of group work; the dynamics of change; teacher motivation and goals; transition from inservice experiences to the job; working climate, structure and organization of workshops, committees and conferences. Needless to say, research on how to evaluate inservice education remains as a fascinating area of study.

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CHAPTER VI

Teaching Load and Assignments in Elementary and Secondary Schools

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SIXTEEN studies conducted in the past three years have been selected for this review. Three of these were made by the U. S. Office of Education and were nationwide in scope. A few of the remaining investigations were conducted on a statewide basis, but most were regional. A majority of the studies reviewed are concerned with surveying the current situation. There is an apparent lack of research on the effect of teaching load on the quality of teaching.

General Surveys

The U. S. Office of Education studies by Tompkins (14, 15) reported teacher opinion on class size from a representative cross section of high schools of 500 or more enrolment. According to teacher opinions a class of 11 to 13 is considered too small for efficient instruction, and a class of 32 or 33 too large. Teachers believed the ideal class to consist of about 25 pupils, but felt that class size could be larger if the students were grouped homogeneously. They reported a significant difference in teaching method between the large and small classes.

In a study by the Research Division of the National Education Association (9) 2200 teachers replied to a questionnaire on teaching load. The results showed that in the elementary schools the average number of students taught by rural teachers was 30 and by urban teachers 32. Eleven percent of all the teachers had 40 or more students. In the rural secondary schools the average number of students per teacher was 129 as compared with 169 pupils per teacher in urban secondary schools. Out-of-class instructional duties also were given some consideration in this study and it was reported that the average work week of elementary-school teachers was 47 hours and 50 minutes, while the average work week of secondary-school teachers was 47 hours and 58 minutes. This study sought information on amount of strain felt by teachers in their work. The results indicated that some teachers working under light loads felt considerable strain, but, on the whole, teachers reporting considerable strain had an average of 33 pupils, and those reporting little strain had an average of only 29.

In a study of teacher load in Illinois high schools (1946-47), employing the Douglass formula, Odell (10) reported that for schools as wholes the first quartile of the school medians was 27.4, the median 29.0, and the third quartile 31.0. Variations in teaching load were more marked when subjectmatter fields were compared than when sections of the state, schools of different sizes, or schools in unit or dual systems were compared.

In a nationwide study of class size in larger high schools, Tompkins (13) reported that 4.5 percent of all classes were comprised of 50 or more pupils. Sixty-three percent of the classes with 50 or more pupils were in physical education, 22.8 percent in music, and 1.2 percent in typing. Classes of 50 or more in English, social studies, mathematics, business education, foreign language, and industrial arts were negligible. Administrators almost unanimously expressed the desire to reduce class size; however, their idea of the ideal class size varied. Most administrators expressed a willingness for large classes in physical education, chorus, band, and orchestra.

In a study of class size of Texas schools, sponsored by the Texas Classroom Teachers Association, Humbert (6) found 26 percent of high-school classes had more than 30 students, 47 percent of grade-school classes had more than 30, and 48 percent of junior high-school classes had more than 30. The junior-high English and social science classes were larger than other junior-high classes. In the grade school 50 percent of the first grades reported more than 30. The percentage dropped up to the fifth grade where 42 percent of the classes had more than 30. In the sixth grade it rose again to 56 percent.

Crim (3) used the Douglass formula to investigate the teaching loads in 44 high schools in seven county systems in Ohio. The 196 questionnaires returned showed women to have heavier instructional loads than men, but men to have heavier extra-class loads than women. The academic subject teachers had heavier in-class and extra-class loads than the special teachers. Most of the 196 teachers carried loads heavier than the 30 Douglass units recommended.

Extra Services

Shaw and Krablin (12) surveyed all city and village superintendents and central school principalships in New York State in an attempt to determine policy and practice concerning compensation for extra services in the high schools. This survey showed that practically all schools have some type of policy to be used in paying for extra services, and that city and village schools are much more likely to have extra pay schedules for extra services than are central schools. The only instance in which all respondents for any group of schools reported extra pay for extra service was that of coaching football in the cities. In a similar study made of the New England states, Knox (7) found that the percentage of those opposed to extra pay for extra work was higher than that of those in favor. Furthermore, the percentage of those in favor of extra pay was higher than the percentage of those systems actually paying extra at that time. Generally the opinions collected in this survey indicated that it would be better to equalize the load than to pay for extra work.

Hill (5), in a study of professional activities of West Virginia vocational agriculture teachers, found they reported a median of 54.2 hours per week for professional activities. The teachers with the largest enrol-

ment had a median of 57.4 hours per week while the median for instructors with the smallest enrolment was 48.8 hours. Personal service to patrons in the school area was given twice as much time by teachers in the small enrolment group.

Subject Combinations

A survey of subject combinations and teaching load for secondary-school teachers of Colorado was made by Romine (11). The replies of 2128 teachers showed about 53 percent of all teachers were assigned in a single field. Approximately 33 percent of all teachers were assigned in 2 fields, 12 percent in 3 fields, and 2 percent in 4 or 5 fields. Assignments involving more than 2 fields were rare in the larger schools. Art teachers were the most favored, 90 percent teaching art only. Variations of total loads were apparent within a single school and among schools generally. There was also considerable variation of loads in a given subject field. The influence of size of school on loads was not clearly established, altho the load was slightly higher in larger schools than in smaller.

Student Achievement

Anderson (1) attempted to determine whether teacher load is a factor in student achievement, with mental ability and pretest scores held constant. The study was conducted in chemistry classes in 56 Minnesota high schools and in 17 schools in other states. He found that students achieved significantly more on the final examination in chemistry when the number of pupils handled per day placed the teachers in the lower one-fourth of the distribution rather than in the upper one-fourth.

Junior Colleges

Altho post-secondary education as such does not come within the scope of the title of this chapter, several studies are being included, because junior colleges are substantially secondary in curriculum.

Koos (8) studied the noninstructional responsibilities, which he called cooperations, of junior-college teachers. The study indicated that only slightly more than one-third of all the cooperations represented were assigned fractional allowances of teaching load for the work involved. About two-thirds of all cooperations had no fractional part of the load allowed. It seemed that only when the discharge of the responsibilities involved a substantial addition to the work load was an allowance for part of the load made. Wellborne (16) conducted a similar study of the professional load of junior-college teachers in Texas. He found that the average teaching load for those reporting from the junior colleges was 23.26 clock hours, and the average number of semester hours was 16.36. The average number of additional hours for duties on the campus or in connection with the teaching was 11.03 per week. The average number of clock hours per instructor spent in off-campus service was 4.10. Total

professional load in clock hours per instructor was 36.58 per week; the total professional load in semester hours per instructor was 20.65.

In a survey of teaching load of junior-college mathematics teachers Ayre (2) found that the median number of periods taught per week was 17.2. Class size ranged from two to 42 with 20 as the average number in a class. Twenty-three percent of the teachers reported they taught from one to six in junior-college classes in other departments than the one they were assigned primarily, and 33 percent taught from one to five high-school classes.

Measuring Teacher Load

Only one study was found concerning the measuring of teacher load. Douglass (4) revised his 1932 Teaching Load Formula thru the cooperation of superintendents and principals in 391 cities. Results were obtained representing 5863 teachers. Revisions were made in subjectmatter coefficients, coefficients for duplicate sections, and in coefficients for the co-curriculum and other cooperative duties. This revised formula is not materially different from the 1932 edition. It was revised enough, however, to make material difference when used to compute the loads of a large number of teachers.

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CHAPTER VII

Welfare of the Teacher

PERCIVAL M. SYMONDS and ROBERT T. FORD

THE past three-year period has seen a further decrease in the amount of systematic research reported in the area of teacher welfare. The importance of this decline in research interest in the general welfare of teachers is accentuated by the fact that during the period the number of persons engaged in teaching and related educational tasks has risen to a new high.

Among the factors contributing to the welfare of the individual teacher that have been treated most extensively in the recent literature are: (a) *economic security* as guaranteed by adequate salaries, provisions for retirement and illness, and tenure of position; (b) *professional adequacy* in respect to training and capacity, which is largely a function of selection and of preservice and inservice education; (c) *personal security*, which involves not only the problem of academic and social freedom, but also that of democratic interpersonal relationships in administrative and classroom situations; and (d) *working conditions*, including length of school day, pupil load, character of assignments and tasks, availability of teaching materials, and the general character of the teacher's physical surroundings.

Much of the literature reflects a tendency to view the welfare of the teacher as important chiefly as it affects that of the pupil and the teacher's effectiveness in the teaching situation. This is clearly indicated in most of the articles concerned with the improvement of economic welfare and with those that deal with mental health and adjustment. Huggett (15), discussing the point of view adopted by the NEA Representative Assembly in 1949, stated the characteristic position of the profession as follows: "Teacher welfare is a valid cause only when it will result in better educational service to youngsters."

General Treatment of Teacher Welfare

In an article addressed largely to persons outside the profession, Haskew (11) analyzed the responsibility of society for teacher welfare. Defining welfare as a psychological and emotional phenomenon that is closely related to social status, and emphasizing the position of the teacher as a producer of skills and technics that society needs, albeit a producer unable to bargain competitively for recompense for his products, Haskew listed the following areas in which society is responsible for the welfare of the teacher: (a) assuring suitable economic returns, (b) providing reasonable security, (c) affording humanized working conditions, (d) increasing satisfactions, and (e) protecting personal integrity. Reviewing the progress made in each area, Haskew noted only slight improve-

ment in the matter of economic returns but marked improvement in vocational security. He noted, however, that there was a general lack of unemployment compensation and that pensions were inadequate. Working conditions were aggravated by overloaded teaching schedules, crowded classrooms, and outmoded school buildings.

In Michigan a committee of the Department of Classroom Teachers (33) of the state education association reported the results of a statewide survey noting that (a) working hours and duties were only fairly satisfactory; (b) physical surroundings were fair; (c) teachers did not receive the same health services as pupils; and (d) rest rooms and work rooms for teachers were seldom available. This committee concluded that altho the morale and spirit of democracy among teachers was high, the irresponsible and apathetic attitude of the community and the inability of the teacher to afford good housing, necessary recreation, and vital health services represented unsatisfactory elements in the teacher welfare situation.

Physical Health

Altho there was a lack of objective investigation, the problem of the physical health of the teacher continued to receive attention. While the major emphasis was upon the fact that teacher illness has negative effects upon teaching efficiency, several writers were concerned with the health hazards involved in the work of the teacher. Randall (26), analyzing teacher absences in the Los Angeles system, found that illness was the major cause of absence. Based on the records of 15,000 teachers, substitutes, and other professional workers, a total of 56,598 working days were lost in 1949-50, at a cost to the city of \$625,426 in illness pay. Randall observed that research has not yet supplied adequate answers on the health hazards involved in teaching. She suggested the need for good administration, relaxed lunch periods, adequate rest and toilet facilities, a healthful school plant, and relief from overloaded programs as safeguards to teacher health. She also advocated that the individual teacher cultivate wholesome attitudes, undergo periodic physical examinations, and give attention to her own nutritional and recreational needs.

Schneider (27) pointed out that the first prerequisite to an effective classroom situation is a healthy teacher. She suggested that health is a personal matter and that each teacher must be sensitive to her own health needs. Holand (14) stressed the importance of including the teacher in the school's anti-tuberculosis program, particularly in view of the fact that the teacher's contacts with children and adults bring about her constant exposure to the risk of infection. Baker (1), Lucas (18), Simonds (28), and others advocated attention to the teacher's health needs as an integral part of the general health program in the school. Williams and Abernathy (38) included a chapter on the health of the teacher in their book on health education in the schools. Steinhaus (30) summarized the position taken by most of these writers both as to the basic issue in the problem of teacher health and the general remedy. He pointed out that

(a) teachers are inclined to neglect their personal needs and (b) refreshment, relaxation, and recreation constitute the principal remedial measures for physical and mental illness among teachers and pupils.

Mental Health and Adjustment

Continuing concern with the mental health and emotional adjustment of the teacher has been evidenced, this concern being motivated primarily by speculation about the influence of neurotic or emotionally maladjusted teachers upon the personalities of pupils. Much of the material produced is highly subjective, and the decline in systematic research that was noted in the last REVIEW has continued. There were but few attempts to study the emotional adjustment of teachers by means of personality scales or other objective instruments. In one such study Clark (5), using the Guilford-Martin Personality Battery with a group of 460 teachers in Flint, Michigan, found that teachers performed better than the norms in *objectivity*, *cooperativeness*, and *agreeableness*; fell below the norm in *general activity* and *ascendancy-submission* traits; and did not differ significantly from the norm in *social introversion-extroversion*, *inferiority feelings*, and *nervous tensions*. He concluded that the mental health of these teachers was comparatively good.

Several workers reported on factors in the school situation that operated to affect the mental health of the teacher. On the basis of a survey of opinion conducted in a summer session mental hygiene class Kvaraceus (17) listed a number of conditions considered to be mental health hazards for the classroom teacher. The items most frequently checked were those which could be subsumed under the headings of unsatisfactory interpersonal relations, personal frustrations, and financial problems. Approaching the same problem from the positive side, Chase (3) reported the results of a survey to show that the following are factors making for satisfaction in teaching: (a) professional responsibility, (b) voice in policy making, (c) competent leadership, (d) adequate salaries, (e) good working conditions, (f) community acceptance and (g) correction of grievances. Tyson (34, 35) discussed certain hazards of teaching. Pollock (25) stressed the effect of such unsatisfactory classroom conditions as inadequate lighting and ventilation, noise, and drab color upon the mental and physical welfare of the teacher. Keliher (16) analyzed the typical teacher's working day for annoyances and satisfactions affecting adjustment. Chrisman (4) emphasized the effect of routine and administrative demands upon the resources of the teacher.

Clark (6) found significant relationships between the adjustment of teachers, as measured by a personality inventory, and the degree of sensitivity to various kinds of pupil behavior. He reported that well-adjusted teachers were more sensitive to some kinds of pupil behavior problems than maladjusted teachers, but less sensitive to other kinds of objectional behavior. Altho it is generally felt that seriously maladjusted teachers are likely both to exercise disturbing influence upon the per-

sonalities of pupils and are unlikely to do well in instruction and classroom management, there is no conclusive evidence that the slightly maladjusted person cannot be a competent teacher. Symonds (32) observed some successful teachers who were definitely neurotic and concluded that in the right place the neurotic teacher might be a highly constructive influence. However, he pointed out, most of the ineffective teachers observed were emotionally disturbed and characteristically projected hostility onto pupils and colleagues. Wolfheim (39) suggested that disturbed or fixated individuals might in some instances have an advantage over normal persons in sensitivity to and capacity to handle the problems of children.

Williams (37) emphasized the blocking of natural desires and the availability of children as an outlet as major factors in teacher maladjustment. She suggested supervisory assistance, periodic mental and physical check-ups, and marriage as remedial measures. Heagen (13) advanced failure to reach mental maturity, lack of ambition, lack of wide range of interests, and defective training as the chief factors in mental and emotional illness among teachers. Articles by Crotty (7), Oetting (24), Stebbins (29), Wasson (36), and Zimmerman and Lewton (40) dealt with aspects of the same problem and generally tended to stress the importance of self-understanding by the teacher as a means to achieving better adjustment.

Administrative Relations and Teacher Organizations

One phase of interpersonal relations that plays an important part in the welfare of the individual teacher is that involving his status with reference to administrative superiors. It has been generally believed that working in a democratic situation where a maximum of self-expression is possible is conducive to a sense of well-being. The literature reflects an increase in democratic practices in school administration and a growing satisfaction among teachers with progress in this area. In one survey Story (31) found that more than 95 percent of 920 teachers polled felt that their school systems conformed at least in a limited way to their individual ideas of democratically administered organizations. Grinnell (10) has summarized teacher opinion on desirable characteristics in administrative relationships, emphasizing the importance of impartiality, cooperation, and appreciation. DeZafra (8), in an article typical of much teacher opinion, enumerated the qualities desired by high-school teachers in a principal.

Provisions for leaves of absence and retirement are basic to teacher welfare. There is evidence of continued progress in these areas. The National Education Association (22, 23) reported the status of sick leaves and disability benefits and of retirement provisions thruout the nation. Burke (2), in a survey of leave practices in New York, reported that sick leaves were granted in all systems, leaves on account of death in the family in 90 percent, leaves to attend educational meetings, 83 percent,

and maternity leaves in 82 percent. Leaves of absence for other reasons ranged downward, with only 17 percent of the systems granting sabbaticals. Morley (21), evaluating a personal experience, set forth the benefits to the individual and to the school system of a sabbatical leave devoted to travel and rest.

Professional organizations and unions are directly interested in the promotion of teacher welfare. It should be noted, however, that these groups have in general stated their primary objective as the improvement of professional service, with individual welfare considered as incidental to the achievement of this end. The literature reflects a continued growth of professional associations both in size of membership and in scope of activities. Martin (19) reviewed the development, status, and activities of local, state, national, and international associations and unions, with special consideration given to the National Education Association and its affiliates. Headley (12) covered some of the same ground and dealt with problems and practices incident to organizing the profession. Martin and others (20), in a symposium on the question of compulsory membership, presented a number of arguments for and against this proposition. The weight of opinion appeared to be contrary to the practice of compulsory membership, largely on the grounds that it tends to be an authoritarian policy that would menace democratic operation of the schools. Gould (9), reporting the outcomes of an actual case, came to similar conclusions with reference to the "closed shop" in the teaching profession. In the symposium mentioned above (20) one of the participants explained that the difference on this issue between the professional organization and the labor union results from the fact that the former regards the teacher as a public servant, while the latter sees him as an economic unit.

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CHAPTER VIII

Economic, Social, and Legal Status of the Elementary- and Secondary-School Teacher

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A CONSIDERABLE amount of research has been reported concerning economic aspects of teacher status. There has been relatively less dealing with social considerations. Legal status was a related factor in several economic issues and it also was of central importance in studies of such matters as tenure and retirement. Research data were available in these areas. Academic freedom has been widely discussed and may be considered either a professional consideration or a legislative concern, depending upon the viewpoint. In either case, there has been little research tho much expression of opinion.

Salaries and Salary Schedules

Salaries of teachers thruout the nation rose thru the past three years from an average of \$2639 in 1947-48 as reported by the U. S. Office of Education (40) to the median of \$2987 reported by the Research Division of the National Education Association (27) for 1950-51. The differences between the average salaries in the several states remained great, with the lowest state average being \$1356 and the highest \$4178 (16). The range of salaries reported (27) is even greater, with the lowest salaries still about \$1200 as they were three years ago. Reports from individual states showed upward trends as exemplified in California (6), Indiana (37), and Wisconsin (42). The Iowa State Education Association (15) suggested that, where salaries were below the national average, effort be made to raise them each year by at least the percentage of increase of the national average. There remains a tendency for larger communities to pay higher salaries than do smaller communities.

Concern has been expressed about the position of teacher salaries relative to wages and salaries of other employed and professional persons, together with concern about the value of teacher salaries in terms of purchasing power. Reports by Stigler (39) and the National Education Association (24, 27) on these problems were the most comprehensive. In general, purchasing power increased less rapidly than salaries and teacher salaries lost considerably in relative position with other professional groups, tho, as Stigler pointed out, direct comparison of teachers' salaries with the gross earnings of other professions overlooks the fact that they usually provide their own quarters and assistance.

Closely related to salary is payment for extra school services. Ashby (2) gave an analysis of the issues while Shaw and Krablin (36) reported on practices in New York State. Teachers' work outside the school involves some of the same issues. Anderson (1) investigated official policies on this matter in Wisconsin, finding them confused. The real

problem in both instances seems to be the need for adequate salaries combined with salary schedules which take cognizance of full teacher load.

By 1950, 31 states (25) and 90 percent of the cities (27) had minimum salary laws, and the preparation type schedule was rapidly becoming the prevailing type. Because of the rapid extension of the schedule principle, salary schedules themselves were the subject of study. The National Education Association Research Division gathered and analyzed data relative to salary schedules in large cities (22).

Salary schedules for school systems were considered both in terms of raising salaries (minimums and maximums), and in terms of systematizing and improving provisions for classifications, and size and number of increments. The Research Division of the National Education Association (22, 28) and two state teacher associations, California (7) and Virginia (41), collected data from a variety of situations and analyzed them in terms of these considerations.

Teacher Tenure

There has been continued progress thruout the nation in securing tenure legislation and in the improvement of statutes. The Committee on Tenure and Academic Freedom of the National Education Association indicated, after reviewing and summarizing court decisions on teacher tenure reported in 1949 (19) and 1950 (21), that it is becoming recognized that a protective framework of sound legislation must undergird just and professional personnel practices. The most pressing judicial issues in 1949 appeared to be the dismissal of probationary teachers and the acquisition of tenure status, while the decisions rendered during 1950 had to do with the interpretation and operation of teacher tenure laws and teachers' contracts of employment. Chambers (8), after reviewing court decisions of four states pertaining to tenure which were reported in the last months of 1948, stated that the wording and interpretation of permanent tenure statutes varies considerably from state to state but that some principles are becoming widely established.

In order to familiarize teachers, school administrators, and school boards with the rights and obligations of teachers under the tenure laws, the Committee on Tenure and Academic Freedom and the Research Division of the National Education Association has published a teacher tenure manual (20). The purpose of the manual is to promote correct procedure with respect to dismissals and resignations of teachers.

Another aspect of tenure which has been under investigation pertains to that of school administrators, many of whom have no tenure other than in teacher status. As part of its study of the legal status of the school superintendent, the Research Division of the National Education Association investigated the selection, tenure, and dismissal of city and county superintendents (29). Edmiston and Garrison (12) made a study, based on the educational directories published by the U. S. Office of Education, of the frequency of change in the office of city and county superintendents.

They found that tenure of county superintendents was poorer than for city superintendents during the six-year period prior to 1940, but that the reverse was true during the nine-year period after 1940. They also reported data that showed present tenure provisions are not effective, or are negated by other factors, because none of the eight states with tenure provisions showed percentagewise decreases for city or county superintendents. This may be due in part to the confusion between continuing contract laws and tenure laws, as indicated by Remmlein (33) who found that superintendents' coverage by tenure laws is ambiguous and that there is indefiniteness unless the superintendent is specifically named in the law. She found that the proportion of tenure laws covering superintendents is the same today as it was 10 years ago altho twice as many laws of this nature have been enacted for classroom teachers.

Pensions and Retirement Pay

Remmlein (35) mentioned two general and two specific trends which are evolving in teacher retirement over the nation. The general trends are (a) the securing of adequate financial support, and (b) stabilizing and raising benefits. The two specific trends are (a) provisions for interstate reciprocity, permitting teachers to cross state lines to take employment in public schools of other states without losing retirement credits, and (b) survivors benefits payable to beneficiaries of deceased members by optional selections.

The Research Division of the National Education Association has continued to investigate and report the financial statistics of state and local teacher-retirement systems (23, 32). The reports cover membership statistics, benefits paid, financial transactions, and investments which make possible the comparison of like and unlike types of systems for the past fiscal year, in most cases ending June 30, 1950.

In cooperation with the National Council on Teacher Retirement the Research Division of the National Education Association made their decennial summarization of court decisions on teacher retirement for the 1940-1949 period inclusive (30). Vested rights, disability retirement, and the effectiveness of election of benefits continue to be major issues. Twenty states rendered 40 decisions in the field of teacher retirement. Also, the Research Division of the National Education Association has analyzed the statutory provisions as of 1950 for 72 retirement systems, 51 state and territorial systems and 21 local systems (26, 34). Benefits payable are described and method of support as well as qualifications for benefits and the administration of retirement systems.

Interest in and investigation of the Federal Social Security Plan has continued. Brazzle (4), after comparing the Iowa Old Age and Survivors Insurance System and the Federal Social Security Plan concluded that in the latter plan old age and survivors insurance is not based on reserves actuarially calculated, but upon the annual estimate of monies required to pay for certain specific assistance privileges. Cooley (10) found in an

opinionnaire study, involving 300 cases, that the teachers responding did not want to be included under the Federal Social Security Plan. There has been considerable writing on the subject, but little that could be classified as research.

Reciprocity in teacher retirement has been under investigation during the past three years. The National Education Association Research Division at the request of the National Council on Teacher Retirement (31) made a study of the problem and recommended that state laws be amended so that liberal deferred allowance plans could be adopted (a) based upon both the state's and the member's contributions, and (b) requiring five years as a minimum length of service. They also recommended the adoption of a plan to do with the purchase of credit for teaching service in other states.

The retirement plans for junior-college teachers were studied by the American Association of Junior Colleges and the results reported by Davis (11) and Martorana (17). Thirteen types of plans were listed by the junior colleges. The most prevalent plan is that which covers all public-school teachers, and secondly, the plan which covers all public-school employees.

This review of research revealed that state and local teachers' organizations over the nation have been active in interpreting and explaining their respective retirement systems, and proposed, or new, legislation affecting or modifying them. The question-and-answer technic has been a prevalent method used.

Community Conditions

Data concerning community conditions of an economic and social nature seemed to be included in studies dealing also with salary, school facilities, and such professional items as curriculum, parent-teacher relations and teacher-administration relations.

A doctoral study by Brown (5) on living and working conditions among teachers in New York State makes clear the importance to teachers of prestige, suitable salary, housing, eating facilities, transportation, out-of-school community service, community restrictions, social contacts, and recreation as well as of other morale factors not the province of this discussion. In general conditions were good or acceptable, but under nearly every category some teachers reported conditions such that they would attempt to leave the position because of them. For example 5 per cent of the teachers felt that lack of suitable housing would cause them to leave their positions. A partial review of the same material was made by Hedlund and Brown (14).

Boroughs (3) in a study of rural teachers in Missouri found poor salary conditions, community pressures to participate in community activities, lack of assistance in finding housing, and poor roads among the most disliked of the elements studied, tho these conditions were by no means present everywhere.

Coffman (9) in a study designed to develop a scale for measuring teacher morale in relation to curriculum reported that 40 percent of those studied found living arrangements difficult and that there was general dissatisfaction with financial security, tho size of salary was not necessarily the critical element since more teachers in a school with lower salaries were satisfied on this point than were teachers in a school with higher salaries.

Academic Freedom

During the three-year period covered by this review scores of periodicals have published articles pertaining to academic freedom in public elementary and secondary schools, the majority being expressions of personal opinion.

The National Education Association Committee on Tenure and Academic Freedom (18) conducted a nationwide study of legislative developments pertaining to teachers' oaths and certain types of state legislation specifically applying to teacher loyalty. The report contains a treatment of the new developments in this field, particularly with respect to "loyalty checks" and prohibitions and restrictions against membership in subversive groups. In 1949, the National Education Association Research Division (23) reported that 26 states prescribed oaths for teachers and several others have related requirements for the alleged purpose of assuring the loyalty of those charged with the education of the country's youth.

Starr (38) and Hammond (13) also summarized and reviewed statutory provisions pertaining to loyalty. Starr, on the basis of cases reviewed, concluded that a majority of justices will sustain the constitutionality of sedition laws and loyalty legislation. Hammond, using the Feinberg Law as an example, stated that the vagueness of such laws placed a potentially dangerous weapon in the hands of a legislature.

Need for Further Research

The research divisions of the National Education Association and of the several state education associations can probably be expected to continue their comprehensive collection and analysis of data on salaries, tenure, and retirement. Suggestions for further activity in this area seem unwarranted save as new problems arise, or as investigations directed at specific sub-problems would be helpful. For instance, salary schedule studies might properly undertake to investigate and define a basic teacher-load and to determine under what circumstance, if any, extracurriculum activity should be compensable. Further research might profitably be undertaken in the social aspects of teacher status. Studies of teacher morale seem to indicate that, in terms of total teacher adjustment, community conditions are not separable from the physical and professional conditions in the school itself. But enough study has been done to show that community circumstances play their important part in teacher satisfaction and turnover. As an example of possibilities for research, several

nonresearch reports point to the value in some situations of school-owned housing for teachers. Convincing evidence of reduced turnover, of improved morale and service as the result of satisfactory housing would be significant. Other community conditions also merit investigation.

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CHAPTER IX

Teacher Supply and Demand

EARL W. ANDERSON and REUBEN H. ELIASSEN

STUDIES in teacher supply and demand reported during the period covered in this review were mostly analyses and accounting procedures relating the supply of teachers to the demand on a national, state, or local scale. Studies ranged in scope from the entire field of teaching to concern for the elementary, secondary, or college field, or for only one subject area. Most investigators studied reasons for the situation they found; several made predictions.

The Current Situation and Predictions of the Future

The most comprehensive studies reported were by Maul (15, 16, 20) for the Commission on Teacher Education and Professional Standards of the National Education Association for the years 1949, 1950, and 1951. He related the number of college students completing standard certification requirements to the number of new public-school teachers for the nation and for each of 19 states. Analyses for Negro teachers were made for southern states. Major and minor subject combinations taught were tabulated, as were the numbers of new elementary-school teachers who had 30, 60, 90, and 120 or more semester hours of credit, and the number of new high-school teachers who had majors in specific teaching subjects. He also analyzed the training of 335,619 elementary-school teachers from 24 states in 1950 (16). Altho in 1951 Maul found some improvement in the imbalance which existed all three years, there were then twice as many secondary-school teachers and one-sixth as many elementary-school teachers being trained as were needed. The only high-school shortages were in home economics, library science, and women's physical education (17, 19, 21).

The U. S. Department of Labor (30, 31) reported results of nationwide studies on employment outlook for elementary- and secondary-school teachers. The situation was described by states for 1950 (30). The 1951 study (31) showed a more acute shortage in the elementary field than in 1950 with predicted high losses of teachers in all areas to industry and the armed forces. Conversion programs from secondary- to elementary-school teaching were reported in 13 states. An increase in the employment of partially prepared teachers under emergency certificates in the elementary schools and in a few subjects in the secondary schools was predicted (31). The Research Division of the National Education Association pointed out the implication for teacher demand in the great increase in total population revealed by the 1950 National Census (23).

A detailed study covering the 22 states covered by the North Central Association of Colleges and Secondary Schools was reported by Maul (18) in 1950. Findings were similar to those of his nationwide studies.

Statewide investigations included the following: Hammond (9) discovered that only 29 percent of the rural teachers and 47 percent of the elementary-school teachers in Wyoming held college degrees and that the state depended too heavily upon teachers prepared outside Wyoming. Stone and Douglass (28) found twice as many secondary-school as elementary-school teachers being prepared in California altho the demand for the latter was three times that for the former. The staff of the Bureau of Educational Research of the University of Florida (32), used questionnaire returns and state department of education records to study the situation in 1949, and to predict needs for additional teachers for six years ahead for Negro and for white teachers, for regular elementary- and secondary-school teachers and for kindergarten teachers, attendance department workers, school psychologists, guidance counselors, and teachers of exceptional children. Data gathered included analysis of new teachers being educated in the state and of those coming in from other states each year. Florida was producing less than half the needed new elementary-school teachers but enough for high schools. Howard (12) made a similar study for Alabama. He estimated that by 1954 enrolments in Alabama will be increased 30 percent for white elementary schools, 16 percent for Negro elementary schools and from 25 to 30 percent in the white and Negro secondary schools.

Travers and Katz (29) predicted the number of new teachers needed in the senior high schools of New York City for the seven-year period from 1955 to 1962 in individual subjects, in the regular, and in the vocational high schools due to increased enrolments and to service terminations. Orleans (25) predicted the number of teachers to be prepared by the four city colleges over a five-year period.

The supply demand situation in industrial arts for the nation was reported by Gerbracht (8) who found a definite oversupply of teachers. Stinnett (27) found a shortage of business teachers.

Three studies were restricted to teacher supply and demand in higher education. Mosier (22) in 1948 found a student-teacher ratio of more than 15 to 1 in 270 of 514 colleges in the territory of the North Central Association that were studied. It would have required 11,000 new teachers to bring the ratio in these colleges down to 15. College teacher turnover appeared to be about 20 percent each year. Lee (13) predicted that an additional 11,000 college teachers a year will be needed to care for replacements and new positions. In contrast to this the U. S. Office of Education (11) thru questionnaire returns from 1374 of the 1888 colleges and universities, estimated that almost 7500 college teachers, or about 3.4 percent, in the United States would be released in 1951 because of reduced enrolments.

Suggested Causes of Teacher Shortages

In an attempt to get attitudes toward elementary-school teaching Nutting (24) questioned 3140 pupils from Grade VI thru XIV, and 351 teachers.

He held nondirective group interviews with 17 groups of twelfth-grade students. He found that a lack of opportunities existed for becoming informed about elementary-school teaching but that most of the respondents saw the work as uninteresting, financially unattractive, and having low prestige. Richey and Fox (26) questioned a random sampling of 3917 students from 100 Indiana high schools. Returns showed that students were poorly informed about teaching; that 13 percent had given serious attention to teaching but only 2 percent had definitely decided to teach; that girls found teaching more attractive than boys, altho 40 percent of the girls thought teaching a deterrent to marriage; and that low salaries, lengthy preparation, and social restrictions were major disadvantages seen in teaching as a vocation.

Causes of turnover in New York schools were found by Andrus (2) to be withdrawal from the profession for 48 percent of the cases studied, dismissal for 23 percent, promotion in 17 percent, and resignation to seek another position because of dissatisfaction in 11 percent of the cases.

Recommendations

Becker (4) urged refresher courses similar to those so successfully set up in Montgomery County, Maryland. Armstrong (3) pointed out the values in the single curriculum in providing teachers for elementary-school teaching. Welte and Fuller (33) and Herge (10) reported a concerted attack in Connecticut by the state teachers colleges, the state department of education, and the public-school administrators to provide teachers to meet the demand that was clearly shown as a result of careful analyses. Eliassen and Anderson (1, 5, 6, 7) included many recommendations in their analyses of investigations reported. Maaske (14) analyzed trends in teacher supply and demand since 1900.

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CHAPTER X

The Measurement of Teacher Characteristics and the Prediction of Teaching Efficiency in College

PAUL C. BAKER and HERMANN H. REMMERS

THE literature of the past three years is characterized by a paucity of vigorous scientific researches on the problems of evaluation of college teaching. At the same time, a number of papers have appeared pointing out the need for such research. None of the latter partake of research, *per se*, but consist of mixtures in varying proportions of (a) expressions of dissatisfaction with the status of research in this area on grounds of triviality, inadequate or meaningless criteria, and failure to ask or to answer a meaningful question, (b) armchair philosophizing about the means and goals of education, (c) attempts to conceptualize, crystallize, and verbalize the real meaning of teaching, and (d) plans and projects for future investigations along new and more comprehensive lines.

Definition of Problems and Needed Research

The papers of Eckert (9), Maaske (15), Nason (20), Ryans (26), and Lawson (14) were typical of this group. The central theme of most of them might be summarized as "What is teaching? What is effective teaching? How can it be measured?" The most complete and comprehensive attempt to answer these questions was the report of the American Education Research Association Committee on Criteria of Teaching Effectiveness (1), published as a supplement to this issue of the REVIEW. The fact that so many educators and researchers are thinking and writing along the same line (tho not an entirely novel line) leads to the conclusion that such discussion may well represent the groundwork for significant research of the future. The practical need for research was emphatically pointed out in the reports by Mackenzie (16), Drummond (8), Clark (5), and Schultz (27) which represent the combined thinking of some 200 academic administrators. These papers reached the same conclusions regarding the urgent need by administrators of acceptable, objective means of assessing the worth of faculty members.

Instructor Evaluation

Despite the many objections to the practice of appraising the effectiveness of teaching in terms of the process (teacher behavior), rather than in terms of the product (pupil behavior), many institutions have launched into extensive teacher rating programs. Considerable satisfaction was expressed with the program at the University of Washington by Guthrie (13) who concluded, "There is no better criterion of teaching aptitude than teaching performance; there are no better judges of teaching performance than students and colleagues." He reported that administrative decisions regarding tenure, promotion, and salary are formulated in terms

of extensive ratings by colleagues and students. High reliabilities were reported for both kinds of ratings, but there appeared to be little relationship between the two.

Remmers and Elliott (10, 22) reported on an evaluation program carried out in 10 Indiana colleges and universities, the intent of which was to offer instructors a means for self-improvement rather than to aid in administrative decisions. Three instruments were used: a scale whereby students rated teachers; a scale by means of which teachers rated administrators; and a test designed to measure knowledge of mental hygiene of the classroom. Variables studied included age, rank, degree, and years of experience.

Attack on the problem thru teacher training was reported in the Associated Colleges of Upper New York by Gilbert (12). The most enthusiastic reports of such programs were those concerned with military institutions. Myers and Peterson (19) reported on the instructor training program and evaluation procedures at the Air University of the U. S. Air Force. Orleans and Kehm (21) similarly reported on practices of the Command and General Staff College of the Army. In both instances a sharp break was made with (a) the civilian traditions of the sanctity of the classroom and (b) the assumption that subjectmatter specialists are necessarily good teachers.

A campuswide rating project carried out at Brooklyn College was discussed in great detail by Riley, Ryan, and Lifshitz (25). Part I of the report was a general discussion of the professor and his relationship to his students; Part II gave the background and plan of the survey; and Part III reported analyses of the rating data. The study attempted to answer the questions: What are the teacher characteristics which students find most desirable? How do teachers react to student ratings? How can the results of such surveys be applied in stimulating better teaching?

Drucker and Remmers (7) answered the charge that only mature alumni can validly judge college and university teachers; that students are too immature, and thus incapable of judging their instructors. Ratings of a group of instructors made by present students were compared with those made by alumni of 10 years standing. Results showed: (a) both groups valued, in essentially the same order, similar traits and capacities of instructors; (b) there was substantial positive relationship between ratings by students and alumni; and (c) student ratings were slightly but not significantly higher than alumni ratings.

An attempt to evaluate teaching efficiency in terms of pupil change was reported by Remmers, Martin, and Elliott (23). The subjects in this study were 37 instructors, all teaching the same course and using the same materials and procedures. All students were graded on a series of department-wide examinations. Thru partial correlation (holding initial ability constant) it was found that instructors whose students showed the greatest gains were rated consistently and significantly higher by their students than instructors whose students showed lesser gains. Bendig (4)

also attempted to relate students ratings of instructors to student achievement, but found wide variations in obtained correlations for different classes.

There appeared to be a growing acceptance of teacher rating procedures by the individual instructor typified by the confessional of Geen (11) and by expressions of faculties as a whole, reported by Mueller (17, 18). In a survey of institutions of higher learning in the country 39 percent reported experience with ratings. Analyses of faculty interest in ratings with respect to various characteristics of institutions revealed that public-controlled colleges seemed more interested than those privately endowed, and that coeducational institutions showed greater interest than colleges with segregated student bodies. Interest seemed to increase with size of enrolment up to 2000 after which there was a slight decline. Colleges in the West and Midwest appear to evince more interest than those in the South and East.

Reviews

Of the reviews of the literature in the general area the most complete to appear was the annotated bibliography by Domas and Tiedeman (6) which covered the period from 1929 to 1949, and contained 1006 studies cross-indexed by subject and author. A more selective review of technics and procedures in teacher evaluation was provided by the monograph by Beecher (3) covering the past 45 years. Reviews of the many studies of the Purdue Rating Scale for Instruction were presented by Remmers and Baker (2, 24).

Summary

In summary, there have been a few feeble attacks on relatively unimportant facets of the problem of instructor characteristics and the prediction of teaching efficiency at the college level. There have been several serious attempts to define the problem anew. It is hoped that the reviewers of the future will find the present hiatus represents a plateau in the curve of progress in the field; or a period of transition between overlapping, relatively trivial, exploratory exercises and more coordinated, concerted attack upon the basic questions.

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CHAPTER XI

Selection, Guidance, and Preservice Preparation of Students for College Teaching

JACOB S. ORLEANS*

THIS chapter summarizes studies in three areas: (a) supply and demand of college instructors, (b) selection of college instructors, and (c) preservice training and guidance. The discussion of supply and demand is based on studies of student enrolment and reports on size of and need for faculty; that of selection, largely on statements of the characteristics deemed important for college instructors. References to preservice training and guidance are largely descriptions of training programs. It is apparent that there has been little research of consequence on the selection and training of college instructors. A much increased awareness of the need for professional preparation of instructors for the college level, however, has found expression in the literature. The area is still almost virgin territory for studies that will reveal just what the needs are and how to meet them.

Supply and Demand of College Instructors

The source of supply of college instructors is generally recognized as the graduate student body, particularly those members who are doctoral candidates. Lee (17) estimated that 170,000 new college instructors would be needed by 1965 to replace those who leave the profession and to take care of larger enrolments resulting from increases in annual births beginning in the early 1940's. That number is larger than the total number now teaching in colleges in this country. The gap between the number of college instructors needed up to 1965 and the number of PhD's who go into college teaching was estimated to average 7000 a year.

Rey (23) found that approximately three-fourths of a sample (one-fifth) of the doctoral candidates at the University of Michigan expected to follow a college teaching career. Mosier (21) reported a turnover among college teachers of 20 percent each year. It should be recalled, however, that his data are for the period following World War II when there was a temporary bulge in college enrolments. Mosier noted also that the number of doctor's degrees granted during 1947-48 fell far short of the demands for college teachers.

Demand for college teachers has been determined thru two general approaches: (a) from estimates of college enrolments based on earlier birth data and trends in college enrolments, and (b) from data furnished by colleges concerning their instructional needs. Interpretation of the data, of necessity, must be in the light of current influences which may be temporary. The demand for college instructors increased to a peak

* With the assistance of Leonard Ostreicher and Lloyd Standlee.

after World War II largely because of the GI Bill of Rights. It should be expected to decrease for a time since the source of college enrolments for the next few years is children born during a period when the number of births declined to the lowest figure in several decades. McGrath (18), basing his conclusions on the findings of the President's Commission on Higher Education, and assuming certain desirable student-faculty ratios, arrived at the estimate that in 1960 our colleges will need a total of 350,000 teachers and administrators. This would mean that approximately 20,000 personnel trained for college teaching and administration would be needed each year until 1960.

Hoff (9) presented data on the decrease in enrolments from the spring of 1950 to the fall of 1951, the successive semester decreases being 9 percent and 12.6 percent. He found decreases in veteran enrolments of 13.6 percent and 40.2 percent for the same periods. Mosier (20) presented findings for 141 private and 81 public colleges and universities based on returns from questionnaires dealing with both demand for and supply of college teachers. In comparison with 1939-40, the enrolments of the colleges increased 65 percent by 1947-48 while the teaching staffs (ranks of instructor to professor) increased 42 percent. The student-teacher ratio in that period had changed from 16 to 1 to 19 to 1. Increases in instructional ranks were largely below the level of instructor. Mosier provided analyses relative to increases by subject area, inability to secure instructors by subject area, and the effects of such conditions on the selection of instructors. *Higher Education* (8) reported the results of a survey dealing with expected decreases in size of college faculty. The findings were based on 1374 returns of questionnaires sent to 1888 colleges and universities in the spring of 1951. Of the colleges responding, 35.5 percent planned faculty reductions for the 1951-52 college year, varying from 53.2 percent of the liberal arts colleges to 4 percent of schools of theology. The total reduction for 488 schools planning reductions amounted to 9.1 percent of the faculties; it amounted to 3.4 percent of the faculties of all the schools responding to the questionnaire. Half of the reductions were expected to occur in English, modern language, business and commerce, mathematics, physical education, and music.

Selection of College Instructors

Trabue (27, 28, 29, 30, 31) reported the results of a study conducted by a committee on the preparation of college teachers of the American Association of Colleges for Teacher Education. A questionnaire relating to 52 traits students think are desirable characteristics of college teachers was sent to the presidents of 820 colleges in the fall of 1949. The traits included in the questionnaire referred to the college teacher as a scholar, a teacher, a counselor, a faculty member, a person, and a citizen. The presidents were asked to check the traits as highly important, important, or unimportant for lower division instructors. They were also asked to note those which they considered important but which rarely are covered

in credentials. The results were tabulated separately by type of college and geographical region. Seventeen of the 52 traits were rated as *highly important* by at least half the presidents. One of the 17 traits dealt with scholarship, seven with teaching, two with counseling, three with faculty membership, four with personal items, and none with citizenship. It was noted that "... most of the items that are considered to be of greatest importance ... are ... least often reported in the credentials submitted by applicants for lower division teaching positions." Differences in emphasis were noted among different types of colleges and according to geographical location of the institutions.

There appear to have been no studies either surveying practices in the selection of college teachers or evaluating methods of selection now in use.

Preservice Training and Guidance

Ashton (4), Hudson (10), Newburn (22), and Tolley (26) discussed the programs for training college instructors in existence in 18 colleges reporting such programs. The U. S. Office of Education in its publication *Toward Better College Training* (12) reported a study based on the practices in 363 institutions concerning their preparation of college teachers. The most frequently mentioned strengths and weaknesses were listed, together with suggestions for improvement. The same publication reported a study regarding opinions on effectiveness of the PhD program as preparation for college teaching. A third study summarized practices in 727 undergraduate colleges in assisting young college instructors. Seventeen items were listed: four having to do with helping the instructor thru professional counseling and supervision; five dealing with measuring outcomes of instruction; three referring to the systematic study of teaching; three involving the rating of teachers; and two relating to administrative devices for stimulating teachers.

Angell and Laws (3) sent a questionnaire to some 300 heads of departments representing 60 colleges and universities in seven northern states. Rating of professional courses in education as "must courses" (3 points), "worthwhile courses" (2 points), or "courses of little or no value" (1 point) for professional preparation of college teachers was required. About one third of the questionnaires were returned. No course received an average rating approaching 3. Three courses (psychology of the learning process, supervised teaching experience, and technics of college instruction) received average ratings slightly higher than 2. In general, these heads of departments did not rate any *professional education* course as highly important. Heads of professional departments rated professional education courses somewhat higher, and heads of science departments rated them somewhat lower, than did chairmen of humanities and social studies departments.

Buxton (5) reported a survey of the opinions of chairmen of departments which "turn out a good many PhD's in psychology." Of 33 chairmen approached, 29 responded. To the question "Do you offer a course con-

cerned with problems of teaching?" five responded in the affirmative and six replied that they conduct group discussions for junior staff members. Twenty-six reported that graduate students were given opportunity to secure teaching experience. Ten gave graduate students tutoring experience. Graduate students helped construct examinations in 25 of the departments, lectured at least part time in 17, conducted quiz or discussion sections in 19, served as laboratory assistants in 21, taught "on their own" in 26, assisted a senior staff member in 12, were supervised in 26, were advised or requested to visit lectures given by others in 13, and had their teaching systematically evaluated in 9. The following, among others, were believed to be objections or obstacles to establishing a formal teacher training program in the psychology department: lack of staff interest, undesirability of formalizing preparation, and too heavy staff load. Buxton comments, "... only a minority of departments are providing much regularized assistance to their prospective teacher PhD's. But the great majority of the departments are nevertheless using them as teachers. . . ."

Descriptions of courses for training college teachers were furnished in various articles (1, 2, 6, 7, 11, 16, 24, 25). McKeachie (19) in describing the program for training teachers of psychology at the University of Michigan reported a correlation of .07 between scores on an advanced comprehensive examination and student ratings of teacher effectiveness at the end of the first semester of teaching. He found the average of students' ratings of all instructors to be 3.0, with an average rating for teaching fellows of 2.92 in their first term and 3.22 in their second term.

Koos (14) presented data concerning the training needs of junior-college teachers in 50 junior colleges in different parts of the country. The variety of subjects taught by each instructor, level of teaching, vocational experience required, extracurriculum responsibilities, and various other items were considered. Koos (13, 14, 15) also reported an investigation of programs of preparation of junior-college teachers conducted by the Research Office of the American Association of Junior Colleges. Data were obtained from 27 institutions concerning such items as requirements for admission, enrolment, degrees granted, and curriculum.

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CHAPTER XII

College Teachers at Work

MARION R. TRABUE

THE chief conclusion that may be drawn from a review of the reports published during the years 1949-1951 is that the status and conditions under which college teachers work have not yet been recognized as fruitful fields for research. Only by a broad interpretation of the term "research," is it possible to include reports of studies that throw some light on current practices and conditions, and the majority of these are little more than tabulations of data regarding salaries and retirement practices. No report was published of any attempt to determine, experimentally or otherwise, the practical effects of any specific condition or institutional practice affecting college teachers.

Appointments and Promotions

Woodburne (26) reported his conclusions regarding a wide variety of faculty personnel problems, based upon personal visits to 46 colleges and universities "of good standing." Altho he gave illustrative descriptions of some of the practices observed, he presented no data to show the frequency of any practice and no information as to whether a given practice appeared more frequently in institutions of a particular size, character, or geographic location. He did not hesitate, however, to conclude his report with a list of 20 "conditions for the development and maintenance of an able faculty."

Epstein (3), on the basis of certain observations that are not fully described, concluded that when poor choices of college teachers are made, "the reason can be simply stated: inadequate investigation." He proposed a definite sequence of steps to be taken by a college executive when selecting a college teacher. The second step proposed was to "be suspicious," especially of one's competence as a judge.

Springer (24) reported the conclusions of a committee of staff members at the University of California as to desirable criteria to be used in the promotion of members of the teaching staff.

Work Load and Duties

Randolph (20) tabulated data regarding 29 members of the faculty in his own institution during three sample weeks and found that the average teacher worked 52 hours per week, of which 14.6 hours were in class or laboratory, 12.2 hours in preparation for classes, and 4.9 hours in research.

Kelly (12) reported that in 1947-48 the average size of class for 1351 faculty members in 147 colleges and universities was 24 students. Approximately one-fourth of these teachers taught 9 hours per week or less, one-fourth 16 hours or more, while 7.3 percent taught 21 hours or

more. The median number of student clock hours of instructional contact for this group of teachers was 341 per week.

Koos (14) reported on the out-of-class responsibilities of 1228 teachers in 48 public junior colleges in 1940-41. The time spent on such assignments ranged from less than one hour to more than 30 hours per week. Extracurriculum assignments accounted for 41.4 percent of the total, administrative responsibilities for 32.1 percent, counseling students for 20.2 percent, and athletics for 6.3 percent. Sponsoring clubs, publications, and student activities took up most time in extracurriculum assignments. Messick (18), in a study of 45 college and university staffs in the Southern Association reported that the majority tried to equalize size of classes rather than attempt to reduce hours of teaching to equalize the load. The survey further indicated that no policy was used in determining service loads of supervisory and administrative personnel. The majority of the replies from the survey showed 15 hours as the normal teaching load.

Jackson (11) studied 106 schools having a curriculum in chemical engineering to determine what was the teaching load of full-time engineering teachers and how much time was allowed for research and writing. Eighty-five percent reported teaching loads of 12 credit hours or less, and 55 percent favored 10 hours or less. Time allowance for graduate thesis supervision was inconsistent. Of the 71 schools with graduate students only 42 gave consideration for thesis supervision on teaching load.

Economic Status and Salaries

On the basis of the estimated number of students who will attend college, Lee (16) reported that 170,000 new college teachers must be recruited and prepared during the next 15 years, or more than 11,000 per year. Fewer than 5000 doctor's degrees are being granted annually, and fewer than 3000 of these go into college teaching. Lee blamed low salaries for most of this shortage.

Kelly (13) reported that women instructors were paid (\$2796) two hundred dollars less than men instructors, and that the difference increased in the higher ranks until women were receiving (\$4473) fourteen hundred dollars less than men as professors. He reported that salary schedules in general tend to increase salaries on the basis of higher rank more than on length of service. Colleges were paying higher salaries to new teachers coming to them from government service (\$3956) and from other colleges (\$3775) than to those from military service (\$3254) or from secondary schools (\$3182). New college teachers were beginning more often (40.4 percent) as instructors and (21.7 percent) assistant professors than as (8.5 percent) associate professors and (7.5 percent) professors.

Imlah (9) reported that college minimum salaries had increased in 1949-50 over 1946-47 by 25.3 percent for instructors, 18.1 percent for assistant professors, 11.8 percent for associate professors, and 10.5 percent for professors. Over the same period the Consumer Price Index had

increased 27.2 percent. In a later report Imlah (10) reported a questionnaire study which seemed to show that in those institutions where the local American Association of University Professors chapter had taken aggressive action salaries had been increased from 3.6 (for associate professors) to 6.9 percent (for instructors) more than in institutions where the AAUP had been less active.

The New York Commission on Financing Higher Education (19) reported that in 1948 the average income of doctors was 150 percent above that of college teachers, and that lawyers were paid 100 percent and dentists 70 percent more than college faculty members. During the period from 1939 to 1947 the salaries in private colleges were reported to have increased only 21 percent (in public colleges, 49 percent), while the wages of operatives in industrial plants had increased 99 percent.

The U. S. Office of Education (8) reported the increases in salaries in 68 land-grant colleges and universities between 1941-42 and 1949-50 as follows: instructors, 72 percent (to \$3202); assistant professors, 56 percent (to \$4085); associate professors, 48 percent (to \$4930); and professors, 43 percent (to \$6132).

Martorana and Koos (17) set up 13 standards for evaluating salary schedules and then examined junior-college schedules and salaries. The number of standards met by an institution's salary schedule was more closely related to the size of the salaries paid than was the size of the student body, altho there was a definite tendency for the larger junior colleges to pay higher salaries.

Spellman (23) found that faculty salaries in 22 publicly-supported colleges for Negroes were from four to five hundred dollars higher than in eight privately-supported institutions.

Fisher (4) received completed questionnaires from 158 women faculty members in colleges of the northeastern states. More than one-half of them were supporting dependents, and only 6 percent had income from other sources.

Academic Freedom and Tenure

Laprade (15) reported that it is now "the rule rather than the exception" for the American Association of University Professors to be consulted before a college discharges a professor. Wriston (29), while admitting that strikes by college teachers are rare, argued that neglect by the American public was driving teachers "to substitute pressure tactics for reason." Cowley (1) proposed a thoro study of academic government, including academic freedom, and Woodburne and Mead (27) described and proposed certain changes in the organization and bylaws governing the College of the City of New York.

Retirement and Social Security

A study conducted by a joint committee of the Association of American Colleges and the American Association of University Professors was

reported by Robbins (21). Approximately 85 percent of college teachers were found to be in colleges that have some type of retirement system, but many younger teachers in these colleges were not protected. About 46 percent of college teachers were in institutions using Teachers Insurance and Annuity Association contracts and 22 percent in institutions covered by publicly administered plans. The committee found that "most public systems are at fault in not vesting fully in the individual the contributions both of the individual and of the institution." Robbins (22) also reported a growing belief that administrative duties should be surrendered at a somewhat earlier age than instructional duties.

The 1950 amendment to the Old Age and Survivors Insurance provisions of the National Social Security laws made it possible for most college teachers to obtain, if they wish, Social Security benefits in addition to other retirement allowances. Explanations of how to add these Old Age and Survivors Insurance benefits were published by Gray (5), Greenough (6, 7), and Walter (25).

Davis (2) found that practically all public junior colleges and more than 36 percent of the private junior colleges have retirement plans, and that membership of new staff members is required in 94 percent of those that do have plans.

Woodburne (28) pointed out the inevitable relationship of the number of promotions that can be made to such other factors as retirements, resignations, and deaths in an institution with a fixed budget.

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SUPPLEMENT

Report of the Committee on the Criteria of Teacher Effectiveness¹

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JACOB S. ORLEANS; H. H. REMMERS, *Chairman*; DAVID G. RYANS

WE HAVE had great teachers from time immemorial. Less effective teachers have also always been with us. We do not need to be convinced that teachers in all cultures, at all grade levels, in all curriculums, vary in their effectiveness. We are also certain that we want as many good teachers as possible.

To satisfy this need we have created systems for the selection and training of persons for the teaching profession. We have devised training programs designed to develop these persons into the best teachers possible. We have set up procedures for supervision and training to improve teachers after they have gone to work. All this activity has, however, proceeded on a meager scientific foundation. We have used common sense, practical wisdom, intuition—that is, high hopes and deep convictions.

During the next 15 years we will be preparing in this country an unprecedented number of teachers. Thus, the need to insure that teachers are professionally well prepared is greater than it ever has been.

Increased understanding of teaching effectiveness could at the very least enable us to understand why some teachers are satisfactory and others are not. Mere understanding after employment might be comforting, but we also hope that we will make predictions as to who will be the better teacher.

The practical problems of teacher personnel takes dozens of different forms. What should be the licensing requirements for teachers? What are the minimum intellectual standards we should set for entrants into teacher training? Should teachers' salaries be based on the merit of the teachers? Should psychology courses for teachers stress learning theory or group dynamics? Which method of supervision has the best effects on teaching? Are married teachers more or less effective than unmarried? Do more liberally educated and broadly cultured teachers do a better job than those who have concentrated more specifically on professional training for teaching? Any school superintendent, professor of education, tax payer, schoolboard member, parent, or pupil could think of many more questions of this kind.

The answers to all these questions, if they are to contain more than prejudice, must depend on our knowing what we mean by a good teacher. The layman's and the scientist's questions alike, the practitioner's as well as the theorist's involve eventually the question of criteria of teacher effectiveness, for these criteria define what we are seeking to understand,

¹ A minority report by Warren W. Coxe will be found at the end of this supplement.

predict, and control. Until they have been established we do not even know for what we are searching.

This crucial condition has long been realized. Defining the dependent variable, or "knowing what questions to ask," is perhaps the most difficult and important step in any scientific enterprise. In short, criteria of teacher effectiveness must stand at the apex of any conceptual system for the development of scientific understanding, prediction, and administration of teacher personnel.

History of the Committee

On February 26, 1950, during the annual meetings of the American Educational Research Association, a group of about 30 persons met informally, upon the joint invitation of Warren W. Coxe and Jacob S. Orleans, to discuss criteria of effective teaching. At this meeting the participants exchanged points of view, research approaches, and descriptions of on-going projects. The minutes of this meeting, prepared by Paul A. Hedlund, concluded with the proposal that the AERA be requested to establish a committee to study the problems connected with the identification of teacher effectiveness.

At the annual business meeting on February 27, 1950, Dr. Coxe moved that the question of the AERA's forming a small committee to define the problems of establishing criteria of effectiveness be referred to the executive committee with the power to act; this motion was carried.

The *AERA Newsletter* of April 1950 carried the following item as part of President Arthur E. Traxler's announcement of the Association's program for 1950:

Inquiry into the criteria of teacher effectiveness. For several years, various individuals and groups in the United States have been concerned with studying the criteria of teacher effectiveness. In the interest of coordinating the work going on in different places, the AERA has been asked to appoint a committee in this area. The appointment of such a committee was authorized at the business meeting.

In a sense, the appointment of this committee will represent a new departure for the Association. It has not been our practice to appoint committees to investigate problems and make reports in different areas of education. It may be that we should consider whether the Association should set up committees in several other areas as well.

In appointing the members of the committee, Dr. Traxler expressed its mission as follows:

It is hoped that in the beginning the committee will bring together persons representing various points of view and approaches to investigation of the criteria of teacher effectiveness and that discussion in the committee will clarify problems and point the way to desirable steps that the committee may take as time goes on. It might be possible eventually for the committee itself to undertake research in this area.

The first meeting of the committee was held on September 7, 1950, at Pennsylvania State College during the annual convention of the American

Psychological Association. The discussion in this meeting dealt with certain basic distinctions necessary to organize the committee's problems. with the procedure for developing an agenda and securing financial support for a longer meeting. During the next few months, attempts were made by various members of the committee to secure a subvention for such a meeting. These attempts were unsuccessful and the committee remained inactive until its next meeting at Atlantic City on February 18, 1951. After the annual AERA dinner, a round-table group discussed the problem of this committee; its report in the *AERA Newsletter* went as follows:

The consensus of the nineteen members discussing this problem was that it is best studied when the question, "What is effective teaching?" is asked. This is in contrast to the question, "Who is the effective teacher?" The group also agreed that to define the effective teacher as a unitary concept was impossible and that we had better also forget the concept of an "ideal" teacher. Positively, we should recognize that there may be effective teachers who may differ markedly among themselves. Perhaps the problem should be studied narrowly: "What is effective teaching in French or beginning arithmetic?" or "What makes an effective fifth-grade teacher in a rural community?" The problems are probably not yet ready to be studied in terms of devices, but still need conceptualization.

The AERA's executive committee on February 18, 1951, granted financial support for an extended physical meeting of the committee.

The committee met on May 6-9, 1951, at the Allerton Estate of the University of Illinois, near Monticello, Illinois. The present report is the product of that meeting with some extensions as a result of further work by individual members. The three-and-a-half-day meeting at Allerton yielded some 14 hours of electrically recorded discussion; these records constituted raw material that has been summarized and organized in this report.

The Committee's Frame of Reference

As the committee's discussion proceeded, it soon became evident that we were delimiting our area of concern, making choices among the possible problems we might consider. It is probably essential to the adequate understanding of this report that our frame of reference (as it emerged in the discussion) be made explicit.

In the first place, we came to consider ourselves a committee on teacher effectiveness rather than teaching effectiveness. Even the teacher's total personality affects the learning-teaching situation. The latter still implies that the committee is concerned with all variables in the teaching situation over and above the contribution of the personnel that determine the effectiveness of an educational enterprise. The former alternative, which the committee adopted, implies that only those effects of education that can be ascribed to the teacher should be considered. Other things being equal, we are not at this time concerned with teaching materials, physical

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facilities, the curriculum, and the like. This means also that we are dealing primarily with the psychological, or behavioral phenomena that exist in the teaching situation and only incidentally for the time being with such other elements as the curriculum, administration, provisions for individual differences, and the school plan. Whether it is profitable to teach apart from the teaching situation is an important problem and possibly an issue.

A second kind of choice that the committee found itself making determined whether we should concern ourselves with the particular situations in which criteria of teacher effectiveness would be used or operate at a more general and abstract level. Criteria, at the situational level may take many special forms according to whether the criteria will be used for determining salary schedules on a merit basis, for selecting teacher trainees, for evaluating teacher-training methods, or for formulating the objectives and technics of teacher education. The committee decided not to treat any of these specific types of purpose for the formulation of criteria of teacher effectiveness at this time. Accordingly we have attempted to operate at a level sufficiently general to embrace all these purposes.

A third choice that the committee seemed to make was between a concern with conceptual formulations of criteria as against operational definitions. This was equivalent to choosing between a concern with the criteria themselves as against technics for obtaining data relevant to the criteria. We settled on the former alternative, the conceptual definition of criteria, on the premise that this constitutes the prior problem, whose formulation must precede any systematic attack on questions of operational definition and technic.

We recognize that in actual research and service, criteria of teacher effectiveness might differ radically according to culture, level, method, curriculum and the like. Prediction of teaching effectiveness for first-grade teachers in the United States, for example, would probably involve considerably different variables than those for teachers of commando tactics in Russia. It seemed logically necessary, however, to order our concepts and categories at the more general level before attempting to reduce them to the particulars that would make them useful in meeting practical problems of research and administration. In a sense, the committee attempted to set up a framework that would embrace all the phenomena exhibited by teachers qua teachers and exclude the phenomena they might exhibit as wives, daughters, citizens, consumers, and the like. We sought to define the ideal role of the teacher, in the sense of conceptually pure rather than of most desirable. This model would provide a frame of reference in which teachers could be perceived.

Finally, the committee found itself attempting to be neutral with respect to values rather than willing to commit itself to a particular set of values or educational objectives. Altho this choice is implied by the foregoing one it is more specific in that it relates to the normative, value-laden

aspects of our culture. We were concerned with teachers who attempt to instil not only democratic ideals in their pupils but also, conceivably, teachers who might be aiming at undemocratic objectives. At the extreme, our framework might apply just as well to teachers attempting to produce thieves as to those attempting to produce honest men. In short, we were concerned with the criteria of teacher effectiveness as they might apply in any system of values. We may have been deluding ourselves as to the degree to which we were ethically neutral. It may be possible to detect in the committee's product a set of ethical norms of which the committee itself was unaware. Nonetheless, we thought we were formulating a set of ideas that could be applied to any conception of the good and desirable.

The committee was sensitive to the possibility that, in operating at a level as abstract and general as this frame of reference indicates, it might produce nothing of any earthly use. Yet the members of the committee represented among themselves a wide variety of intensive experience in working on research and administrative problems concerning teacher effectiveness. So it was not from any lack of appreciation of technical and practical considerations that the committee chose to operate at this "impractical" and theoretical level. Rather, as our discussions proceeded, whenever we confronted choices of the kinds enumerated above, it almost always seemed preferable to try our wings in the direction indicated. Over the past few decades there has been no lack of attention to the technical, practical, and operational problems involved in working on criteria of teacher effectiveness. The present analysis amounts to a studied attempt to go above the battle, to avoid involvement in the skirmishes, however important these may be, and instead to survey the entire domain of criteria of teacher effectiveness.

Definitions of a Criterion

The phrase "criteria of teacher effectiveness" contains two terms that should be defined. What do we mean by a criterion? What do we mean by effectiveness? We consider the first question in this section and reserve our definition of effectiveness to the next section.

Criterion. A criterion is a standard against which a measurement is made in estimating the validity of the measurement. A criterion is always concerned with one or more specified dimensions of whatever is being measured. For example, if tables are being measured, one criterion dimension may be the length of the table and another may be its weight. Much of the effort of the committee was directed toward the identification of *criterion dimensions*; the notion of criterion dimension is thus a more exact term for denoting what the committee was concerned with than is the term criterion. That is, we were concerned with what dimensions of teacher effectiveness should be considered in developing criteria of teacher effectiveness.

Criterion dimensions are abstractions of just one or a few types of characteristics from the infinite variety of characteristics of a set of

objects. Of all the properties of tables we may abstract just the single kind of property we call length. Of all the infinite properties of teachers, we are abstracting only those that we are willing to call "effectiveness." Once we have abstracted the particular property we wish to include in our criterion, we have the particular criterion dimension that we shall call "effectiveness."

The basic requirement to be met in the identification of a criterion dimension is relevance to the purpose of the measurement. In identifying length as the criterion dimension of a table, we imply that length is important for our purpose in measuring which may be, say, to determine whether the table will fit into a certain space. In identifying effectiveness as a criterion dimension of teachers, we imply that the purpose of our measurement or appraisal of teachers is to estimate whether they will produce desired amounts and types of changes in pupil behavior. The attainment of this purpose may in turn be a prerequisite to the attainment of more ultimate purposes, such as the development of happy citizens in the good society.

The Ultimacy of Criteria. A difference of terminology has characterized many considerations of criteria of teacher effectiveness. In some discussions only ultimate criteria, usually "effects on pupils," have been considered denotable as criteria. In others, almost any characteristic of teachers has been admitted to the class of dimensions called criteria; thus the teachers' knowledge of their subject would be called criteria.

One way out of this difficulty is to think of criteria as ranging along a continuum of "ultimacy-proximacy." The closer a characteristic of teachers is to the ultimate purpose of their teaching, the more ultimate is that characteristic or criterion of the teachers. Such a characteristic as the teachers' effect on the pupil's achievement of a happy, socially useful life would probably be universally accepted as an ultimate criterion. The teachers' effect on the pupils' achievement of the immediate objectives of the given curriculum segment for which the teacher is responsible is somewhat less ultimate. We might arrange a few of the more frequently obtained measures of teachers' characteristics in order of decreasing "ultimacy-proximacy" as follows:

Teachers' effect on:

- pupils' achievement and success in life
- pupils' achievement in subsequent schooling
- pupils' achievement of current educational objectives
- pupils' satisfaction with the teacher
- parents' satisfaction with the teacher
- superintendents' satisfaction with the teacher
- Teachers' "values" or evaluative attitudes
- Teachers' knowledge of educational psychology and mental hygiene
- Teachers' emotional and social adjustment
- Teachers' knowledge of methods of curriculum construction

Teachers' knowledge of the subjectmatter
Teachers' interest in the subjectmatter
Teachers' grades in practice teaching courses
Teachers' grades in education courses
Teachers' intelligence

Many more characteristics of teachers, each of which could be measured by a variety of technics, could be listed. Opinions would differ as to where they should be placed on the scale of ultimacy. We would have further difficulty in deciding at just what point on the scale the criteria becomes not ultimate, but intermediate, or immediate.

Below the most ultimate criterion, any criterion must depend on the degree to which it can be considered related, relevant, or proximate to the ultimate criterion. For example, the teachers' intelligence is acceptable as a criterion only insofar as it is related to the teachers' effect on pupils' achievement and success in life. Similarly, the teachers' effect on pupils' satisfaction with the teacher may be considered acceptable only insofar as it is correlated with our most ultimate criterion. We may think, therefore, of a kind of regression from the ultimate criterion to lesser and lesser criteria, each depending for its standing on its relationship to criteria closer to the top.

As is indicated below, the committee divided this continuum into two parts, the effects of teachers ("ultimate") and the behaviors and characteristics of teachers ("proximate").

Categories of Effect

Having specified our purpose as the identification of relevant criterion dimensions and having accepted "effectiveness" as the general term embracing the particular kind of dimensions of teachers with which we are concerned, we are ready to develop what we mean by this dimension.

Effectiveness. Effectiveness is the degree to which an agent produces effects. The question immediately arises, which effects and on what? And as soon as the objects of the effect are specified, the next question becomes, on what dimensions of these objects are the relevant effects to be observed?

These questions led the committee to specify three kinds of objects of teacher effect. These three categories of effect, in terms of the object affected, are (a) the pupil, (b) school operations, and (c) the school-community relationship.

Effects on pupils have long been accepted as relevant criterion dimensions of teacher effectiveness; pupil growth, change, gain, development, learning, and the like, have often been denoted the ultimate criteria of teacher effectiveness. But effects on school operations and on communities have *not* had similar currency as criteria of teacher effectiveness. On what grounds can they be added to the traditional "effects on pupils" as criterion dimensions of coordinate significance? The question is not whether these effects are important but whether they are conceptually as "ultimate in importance" as effects on pupils. Are effects on school

operations and on communities in relation to school programs merely means toward more ultimate ends, effects on pupils?

The committee's position on this question reflects a certain conception of school and community organization. Pupils and teachers function in the social matrix provided by schools and communities so that all of these constitute a socio-psychological field in which all elements are interactive and interdependent. To say that we need take account of the teacher's effects on school operations and on communities' relationships to schools only as these bear on effects on pupils, is to deny the essential interaction and interdependence of pupils, schools, and communities. All three categories of effect must hence be given equal status conceptually.

Let us consider in further detail the nature of each of these categories. In doing so, however, we shall insist that our details are for illustrative purposes only; the specific subcategories of effect spelled out below are recognized by the committee as tentative and distinctly open to revision.

Effects on Pupils. The effects on pupils that are relevant as criterion dimensions of teacher effectiveness are the extent to which educational objectives are attained. Effects on pupils other than those of the teacher in relation to accepted educational objectives must be excluded as irrelevant. For example, if emotional and social adjustment is not considered an objective to be achieved by pupils of a given teacher, then achievement of such an objective is irrelevant as a dimension of the objects of effect, pupils, by which the effectiveness of that teacher is determined. So educational objectives become the dimensions of our first major category of effect, effect on pupils. Since educational programs differ in their objectives according to the culture, age level, and the like, in which the teacher operates, the appropriate subcategories of effect on pupils will differ accordingly.

The committee considered it appropriate to its function to face the issue of educational objectives. Hence we suggest some subcategories of objectives to clarify our concept of effect on pupils.

The conceptualization and classification of educational objectives is itself a major enterprise. The so-called Taxonomy Group, which has been working on this problem under the informal chairmanship of Professor Benjamin S. Bloom of the University of Chicago for several years offers one approach. For illustrative purposes we present below excerpts from some of the major headings under one of the Taxonomy's three major domains of objectives (Cognitive, Affective, and Psychomotor). The Taxonomy at present has been developed further in the Cognitive than in the other two domains. The Taxonomy has actually been elaborated in considerably more detail than is included in these excerpts.

Excerpts from the Taxonomy of Educational Objectives

1. THE COGNITIVE DOMAIN

1.00 Knowledge

Knowledge, as defined here, involves the recall of specifics and universals, the recall of methods and processes, or the recall of a

pattern, structure, or setting. For measurement purposes, the recall situation involves little more than bringing to mind the appropriate material. Although some alteration of the material may be required, this is a relatively minor part of the task. The knowledge objectives emphasize most the psychological processes of remembering. The process of relating is also involved in that a knowledge test situation requires the organization and reorganization of a problem such that it will furnish the appropriate signals and cues for the information and knowledge the individual possesses. To use an analogy, if one thinks of the mind as a file, the problem in a knowledge test situation is that of finding in the problem or task the appropriate signals, cues, and clues which will most effectively bring out whatever knowledge is filed or stored.

1.10 Knowledge of specifics

1.11 Knowledge of terminology

1.12 Knowledge of specific facts

1.20 Knowledge of ways and means of dealing with specifics

1.21 Knowledge of conventions and forms

1.22 Knowledge of trends and sequences

1.23 Knowledge of classifications and categories

1.24 Knowledge of criteria

1.25 Knowledge of methodology

1.30 Knowledge of the universals and abstractions in a field

1.31 Knowledge of principles and generalizations

1.32 Knowledge of theories and structures

2.00 Intellectual abilities and skills

Abilities and skills refer to organized modes of operations and generalized technics for dealing with materials and problems. The materials and problems may be of such a nature that little or no specialized and technical information is required. Such information as is required can be assumed to be part of the individual's general fund of knowledge. Other problems may require specialized and technical information at a rather high level such that specific knowledge as well as skill in dealing with the problem and the materials are required. The abilities and skills objectives emphasize the mental processes of organizing and reorganizing material to achieve a particular purpose. The materials may be given or remembered.

2.10 Comprehension

2.11 Translation

2.12 Interpretation

2.13 Extrapolation

2.20 Analysis

2.21 Relationship

2.22 Organizational principles

2.30 Synthesis

2.40 Application

2.50 Evaluation

These are the kinds of objectives which some pupils of some teachers will be educated to achieve. There are of course others. The degree to which such objectives are achieved by the pupils of the teacher who pro-

fesses one or more of these objectives constitutes the effect on pupils by which the teacher's effectiveness is judged.

Altho developed in the first instance to aid in communication among evaluation workers, the taxonomy obviously provides a potentially fruitful source of suggestions concerning the types of effects on pupils by which teachers may be judged. As it develops, the taxonomy should afford more and more adequate avenues to the understanding of this first major category of effect.

The problem immediately arises of evaluating progress toward these objectives, that is, of constructing, administering, and interpreting means by which to appraise pupil growth and achievement. This problem concerns technics of obtaining data relevant to our criteria. As already stated, the committee recognized these problems but does not accept them as appropriate concerns at the present level of discourse.

The second major type of technical problem that arises is how do we control or eliminate, either statistically or experimentally, the influence of factors affecting growth and achievement other than those directly traceable to teacher behavior? As we all know, factors like the socioeconomic background, previous educational experiences, and previous intellectual and emotional makeup of pupils will affect their achievement of educational objectives under the influence of a given teacher. In using pupils' growth and achievement as a criterion dimension of the influence of teacher effectiveness, we must purify our measures of achievement of the influence of these "nonteacher" causes. Again, this is a problem of technic in the design of experiments and measurement procedures that will be left to a later stage of the committee's development. Our intent here is merely to make clear effect on pupils as a major category of effect, and conceptually a major criterion dimension of teacher effectiveness.

Effects on School Operations. For this category we had no such systematic help as had been provided by the Taxonomy Group for organizing the category of effects on pupils. Our elaboration here must therefore be even more tentative. By school operations, we mean: (a) the formulation or development of school policy, and (b) the execution or application of school policy.

Formulating or developing school policy goes on in a social structure provided by the administrative organization of the school. This may consist of a single teacher in a one-room school, or a corps of teachers on a single level subordinate to the principal, or a more complex pattern consisting of a superintendent, supervisors, principals, department heads, and teachers.

We must also recognize that coexistent with the official-ideal structure of the school is the unofficial-real social organization thru which school policy is developed and carried out. The real "leaders" and "followers" may thus not be the same as the official ones.

The social processes thru which school policy is formulated and executed may take a variety of forms. Among these may be faculty meet-

ings, committees, individual work, clique operations, consultation with experts, addresses to schoolboards and members of the faculty, and the like. The effect of the teacher in any of these processes may take many different forms.

Once we have identified the social structure and social processes through which school policy is formulated and executed, we need to identify the dimensions of school operations on which the effect of these operations will be observed. That is, just as achievement of educational objectives is the dimension of pupils on which the teacher's effect is observed, so we need the basic dimensions of school operations on which the effect of the teacher is to be observed. The following are illustrative of the kinds of school operations we have in mind: use of school buildings, acquisition and distribution of supplies, securing pupil attendance, providing health services, operating evaluation programs involving the pupils of more than one teacher, execution of inservice teacher education programs.

The effect of teachers on such dimensions of school operations is a relevant criterion of teacher effectiveness. If a teacher operates through various social processes within the given social structure of a school so as to exert an effect on these dimensions of school operations, then this effect may be considered a criterion dimension of that teacher's effectiveness. Again the question arises of measuring the teacher's effect and sharpening this measurement by "partialling out" influences that cannot be ascribed to the given teacher; again we defer these questions for subsequent consideration.

Effects on School-Community Relation. Communities can have many kinds of relationships to their own public schools. They may be interested or uninterested, favorable or antagonistic, cooperative or uncooperative, supporting or threatening, and the like. What we need here are the dimensions of the relationships of the community to the schools. The teacher's effect on these dimensions may be considered relevant to teacher effectiveness.

Perhaps the basic dimension of this relationship should be the community's understanding of the schools, that is, the school's purposes, curriculum, procedures, and problems. The effect of the teacher on the community's understandings of this kind may then be a relevant criterion dimension of the teacher's effectiveness.

Perhaps a second major dimension of the community's relationships to the schools is the community's participation in school affairs. The degree to which citizens vote on school issues, become active members of parent-teacher associations, take an interest in the school activities of their children, and the like, are dimensions of this relationship. The teacher's effect on these dimensions may be considered relevant to teacher effectiveness. The teacher who affects the community's relationships to the schools more desirably along these various dimensions should thus be considered the more effective teacher.

Categories of Teacher Behavior

Thus far we have attempted to delineate the kinds of effects that teachers may have which should be considered relevant to teacher effectiveness. But before the teacher can have an effect, there must be teacher behavior. Thus, if we think of our various types of phenomena as serially linked, with "effects" as phenomena at one end of the chain, then the behaviors of teachers may be considered phenomena that occur before the effect. In this section we attempt to categorize the types of teacher behavior that may logically be considered prior to each of the types of effect we have identified. In parallel with the foregoing discussion, we have three types of behavior: behaviors affecting (a) pupils, (b) school operations, and (c) school-community relationships. We now consider each of these in turn.

Behaviors in Relation to Pupils. Of the many ways in which teacher behavior can be conceived, we have chosen an approach in terms of the logic of the teaching process. What are the things that teachers do as teachers, regardless of the subject, age-level, educational objectives, or teaching methods they may deal with? First, the teacher formulates or selects the objectives of his teaching. This may consist of a genuine creative effort on the teacher's part or merely a passive acceptance by the teacher of objectives handed down by superior authorities in the educational organization or by tradition. But regardless of their source, objectives must be accepted by the teacher as an early step in the teaching process. So the teacher must commit himself to an attempt to bring about certain effects on pupils and these effects are the objectives that the teacher sets up for his pupils and hence for himself. Involved in this step in some way must be an understanding by the teacher of the characteristics of his pupils in relation to the objectives. That is, to some degree (and we allow logically for a zero degree), the teacher must evaluate his pupils' needs, readiness, and interest in attaining the objectives.

A second step that teachers must inevitably take, even if unconsciously and unsystematically, is to formulate perhaps with the pupils the experiences thru which pupils should go as means for their achieving the objectives. They must decide whether pupils should listen to a lecture, read a certain book, practice solving certain problems, engage in certain kinds of planning, face certain kinds of choices, drill themselves on certain skills, and the like. Again, this step may represent the teacher's original work or merely the acceptance of procedures from authorities or tradition. However the step is taken, it is logically necessary for all teachers.

A third step in the teaching process is arranging for pupils to have the experiences formulated in step two. The teacher must set the stage for these experiences, organize them into an effective sequence, and integrate each experience with the others. The step may consist of making an assignment, calling for a recitation, suggesting the formation of a committee, delivering a lecture, or asking for a self-evaluation. In short, the

teacher must somehow arrange for his pupils to go thru the experiences formulated in step two as a means of achieving the objectives set up in step one.

A fourth step in the teaching process is evaluating the pupils' growth and achievement of objectives. The teacher may do this not at all, or he may ask his pupils to do it entirely, or he may establish quite formal testing programs. The teacher's evaluation may consist merely of raising an eyebrow, of saying "right" or "wrong," of constructing and administering formal examinations, or of cooperating with pupils in the development and execution of self-evaluation procedures. In any case, all teachers may be considered from the standpoint of the way in which they carry out evaluations of their pupils' achievement of the educational objectives they have tried to implement.

A fifth step in teaching which provides a standpoint from which teachers may be viewed is the reappraisal of objectives and learning experiences in the light of the evaluations resulting from the preceding step. Teachers engage more or less in the process of revising their objectives and other behaviors on the basis of experience. Whether a teacher's pattern of behavior remains the same or undergoes continuous adaptation, it seems important to specify this step in our conceptualization of teacher behavior.

We have thus a set of categories of behavior which all teachers must exhibit in greater or less degree in their efforts to have effects on pupils. The whole problem of determining what teachers should be and how they should behave consists of establishing relationships between teacher behavior and teacher effects. When we know what kinds of behaviors by teachers produce what kinds of effects on pupils, we have a basis for handling a host of problems at which teacher selection, training, supervision, and evaluation programs are aimed. How can the hypotheses concerning these relationships be set up and tested? We shall consider this question in a later section of this report.

The foregoing categories of teacher behavior in relation to pupils represent a kind of job analysis of the teacher function.

It is possible also to develop dimensions of the teaching process in more psychological terms. Such psychological dimension of teacher behavior would deal not with the steps logically involved in teaching *per se* but with the persistent personality variables, such as traits, schemes, or motives, that pervade a teacher's behavior in carrying out all of these logical steps. The teacher's personality may thus be considered as a set of phenomena, one further step removed from the effects of the teacher. For example, to say that a teacher is more or less intelligent, dominative or integrative, authoritarian or democratic, businesslike or disorganized, *intrapunitive* or *extrapunitive*, (to cite some of the variables that have achieved some currency) means that these adjectives somehow apply over some considerable range of the logical steps in the teaching process.

These are the terms in which much description of teacher behavior has been carried out. Our point here is simply that this kind of dimensionalization of teacher behavior should also be kept in mind, not as an alternative to the logical analysis of teaching, but as a level of discourse still further removed than the logical analysis from the more ultimate dimensions of teachers, their effects on pupils.

Behaviors Affecting School Operations. What kinds of behaviors do teachers manifest that have an effect on the operations of the school? We have already mentioned the processes, social organizations, and school operations that we have in mind here. Again we shall only illustrate a logically structured characterization of teacher behaviors affecting school operations. We shall make these parallel with the categories of teacher behavior in relation to pupils.

First, the teacher must participate in the formulation selection or acceptance of certain objectives of school operations. These objectives may perhaps ultimately be reduced to effects on pupils but at the level of school operations they are concerned less immediately with individual pupils and more with the administrative, organizational, material, and interpersonal means or tools for carrying on the teaching-learning process.

We have no taxonomy of the objectives of school operations such as we have tentatively for the objectives of pupil achievement. But we have already illustrated school operations in terms of the use of school buildings, acquiring and distributing supplies, securing pupil attendance, and the like. Each of these operations can have particular objectives determined by local facilities and problems. So a teacher's first step in affecting school operations must be to accept or formulate certain objectives for these operations, such as maximizing utilization of space, increasing the holding power of the school, reducing hidden tuition costs for students, or maximizing the use of school facilities as recreational centers for the community's young adults. Whatever these objectives may be in a particular school system, the teacher must to some degree inevitably formulate his own conception of the objectives of school operations.

Second, teachers must conceive of technics and methods by which the school can go about achieving the purposes of their operations. In his informal relationships with other teachers and thru more formal relationships such as committees, the teacher must help in making decisions as to the steps a school will take in achieving the objectives of its operations. Whether the operation is maximizing the efficiency of building utilization or acquiring and distributing supplies, teachers will have a more or less active role to play in developing the technics required.

Third, teachers will participate in carrying out the technics and procedures formulated for achieving the objectives of school operations. As individuals or as members of committees of teachers, they will perform the tasks, such as referring to guidance counselors, maintaining the attendance records, filling out pupils record forms, and the like, which

may be necessary by the particular school operations in which the teacher becomes involved.

Fourth, the teacher will need to help in the evaluation of the effectiveness of school operations. How good is the utilization of the school building, the guidance program, the record system, the inservice training program for teachers? Teachers are involved at least logically, in appraising the effectiveness of the operations of their school.

Finally, teachers must reappraise and reformulate the objectives of school operations in the light of their experience in the foregoing steps. They must help in deciding to what extent certain objectives are realistic and attainable or, on the other hand, no longer desirable. Teachers must participate in this process of "feed back" by which objectives will continually be reformulated.

Just as we pointed to the possibility of dimensionalizing teacher behavior in relation to pupils in terms of personality variables, so we can point to similar variables that may be particularly relevant to the categorization of teacher behavior in relation to school operation. Again we offer only tentative illustrations, for there is no widely accepted set of constructs of demonstrated validity for our purposes. But since teacher behavior in relation to school operations is peculiarly a matter of the teacher's functioning as a member of a group of his peers, it may be that the "functional roles of group members" identified by Benne and Sheats¹ will serve to illustrate.

First, they identify three kinds of roles: group task roles, group building and maintenance roles, and individual roles. Each of these kinds of roles has various forms, of which the following group task roles are illustrative: initiator-contributor, information seeker, opinion seeker, information giver, opinion giver, elaborator, coordinator, orienter, evaluator-critic, energizer procedural technician, and recorder.

A teacher may play each of these roles more or less frequently as member of a group of teachers in a given school concerned with the various steps in formulating and executing school policy. Such a description of teacher behavior in relation to school policy is again one step further removed than our logical analysis from ultimate effect on school operations. But such a set of constructs may indeed prove useful in the description and analysis of teacher behavior in relation to school operations.

Behaviors Affecting School Community Relationships. Again, we can identify a series of logical steps in the teacher's functioning so as to affect community relations with the school program. The teacher can become involved in formulating the objectives of such community relationships developing procedures necessary for attaining those objectives,

¹ Benne, K. D., and Sheats, Paul. "Functional Roles of Group Members." *Journal of Social Issues* 4: 42-47; 1948.

carrying out those procedures, evaluating their effectiveness, and reappraising the objectives in the light of experience.

Similarly, at one step further removed from effects on community relations are the teacher's persistent modes of behavior, or personality variables, as constructs for conceptualizing such behavior.

The teacher's behavior here is generally in relation, not to pupils or to members of the school staff, but to the citizens of the community, the parents or patrons of the school, state and national educational organizations, the economic and political leaders of the community, and the like. What the teacher does to promote understanding of, and involvement in school affairs on the part of the community is relevant behavior here.

Hypothesizing Relationships Between Teachers' Behaviors and Effects

Dependent and Independent Variables. So far we have been concerned primarily with identifying two major kinds of variables, teacher behaviors and teacher effects. These variables may be considered, respectively, as independent and dependent variables. That is, the effects of teachers on pupils, school operations, and community relations are considered to be dependent on the behaviors of teachers in relation to pupils, school operations, and community relationships.

We have also seen that each of these kinds of variables has many possible dimensions, logical and psychological. A given hypothesis concerning a relationship between teacher behavior and teacher effect must therefore be concerned with a particular dimension of teacher behavior and a specific kind of effect. The number and patterns of possible combinations of behavior and effect is readily seen to be very great by whatever scheme the two kinds of variables are conceptualized. Which of these very numerous possible relationships should be set up in formal hypotheses to be tested thru empirical research? This is the basic question of research strategy that must be faced before a fruitful attack can be made on the welter of phenomena in this area. The committee discussed a variety of approaches to this question.

Intervening Variables. In the first place a third major kind of variable should be taken into account. These in general may be called intervening variables and, more specifically, variables or properties of the object (pupil, school operations, or community relationships) being affected. Hypotheses should therefore consider the nature of the pupils for example, involved in any relationship between teacher behaviors and effects on pupils. The same behaviors may have different effects on pupils of different intelligence, socio-economic background or previous educational experience. For example, one may hypothesize that the more business-like teachers, who organize the pupils' activities in the classroom to a greater degree, will affect pupils so that they achieve certain knowledge to a greater degree. But such a hypothesis will be more meaningful, and more likely to survive empirical test, if it is formulated so as to specify

whether the pupils involved have had previous experience with business-like teachers or with more "laissez-faire" teachers. Or, again, the teacher whose selection of activities for pupils is such as to stress the meaning of certain operations to be performed by pupils in arithmetic will have different effects from the teacher who selects more rote and drill-type activities, but only as function of whether the pupils involved have had certain previous experiences with meaningful or rote teaching. Or more intelligent teachers, for example, may have more desirable effects on more intelligent pupils, while teachers of mediocre intelligence may be more effective with pupils of mediocre or low intelligence. Also situational conditions must be taken into account. The same behavior may have different effects depending on the grade level, the type of community, etc. Also account must be taken of differences in type of educational program, and differential effects of the same behavior in the same situation on different types of pupils. In short, hypotheses should take into account relevant properties or dimensions of the pupils involved in relating teacher behaviors to teacher effects.

The same logic applies to school operations and community relationships as objects of teacher effect. A teacher who aggressively promotes greater faculty participation in policy formation may have one effect in a school with a history of low teacher morale and another effect in a school where the administrator's benevolent despotism has not been accompanied by low teacher morale. And teachers who stimulate increased participation by parents in school affairs in a community of homogeneous social class composition may have a different effect in a neighborhood containing families more varied as to parental educational level and income.

In short, hypotheses concerning relationships between teacher behavior and teacher effect must not be formulated in disregard of intervening variables, that is, properties or dimensions of the objects of effect. Edwards and Cronbach² have made this point in connection with research in psychotherapy. Proper regard for this principle should result in hypotheses that are more subtle, conservative, and realistic in relation to the factors that actually govern relationships between the behaviors and effects of teachers.

Specifying Dependent Variables. A second principle that can be inferred from our discussion of categories of effect is that hypotheses should formulate quite specifically and narrowly the types of effect, or dependent variables, to which they pertain. Effects on pupils, for example, can be measured in terms of change in score on tests of knowledge or of intellectual abilities and skills. But effect may also be conceived, as W. A. Brownell has emphasized as the amount of *transfer* that pupils can make from one learning to others, or as the *retention* of various achievements.

² Edwards, Allen L., and Cronbach, Lee J. "Experimental Design for Research in Psychotherapy." *Journal of Clinical Psychology*. (In press)

Effects on pupils may be along any of the numerous types of achievement of educational objectives categorized in the Taxonomy, and these *may be affective and psychomotor* changes as well as cognitive ones. Hypotheses concerning relationships between *teacher behavior and effects* should be formulated in terms of effects much more specifically defined, and in much more varied terms, than the one dimension implied by the total score on a single achievement test. And the different kinds of effects should be kept separate rather than combined into a single complex index. Lumping many effects together obscures differentials in achievement that may be highly significant to the understanding of the teaching-learning process.

Patterns of Teacher Characteristics. The independent variables, teacher behaviors, should also be considered in all their complexity and specified as exactly as possible. This principle has indeed often been followed; in fact much research has been done on relationships between quite specific characteristics of teachers, such as intelligence or attitudes toward child behavior, and various criteria of teaching effectiveness, such as pupil achievement of various objectives or pupils' attitudes toward teachers.

But we must raise the question whether hypotheses should be formulated which involve not merely single dimensions of teachers but rather various profiles or patterns of teacher characteristics. For example, the intelligence of teachers should not be studied alone in its relationship to effects on pupils, nor should, say, the dominativeness-integrativeness of teachers be considered alone. Rather, both of these characteristics might well be considered as a pattern of teacher characteristics; if intelligence and dominativeness are dichotomized as "high" or "low," we would then have four possible combinations of these two characteristics. Then the hypotheses might deal with the relative effectiveness of each of these four types of teachers.

As more than two dimensions are involved in the pattern, the number of possible patterns increases rapidly. Hypotheses might then be formulated on the basis of the peculiar small number of patterns which may be considered to have only certain effects. Thus there may not be any single profile of teacher characteristics that results in certain effects on pupils. The same effects, may conceivably be brought about by a variety of different kinds of teachers.

The Value of "Psychologizing." The committee discussed the desirability of more systematic "psychologizing" of hypothesized relationships between teachers' behaviors and effects. Too often in the past, teachers have been measured along a variety of dimensions whose plausibility as correlates of effectiveness has been of the same variety that any layman might depend upon. It may be fruitful, therefore, to submit any teacher characteristic involved in a research or administrative study to the general question, "On what grounds in learning theory or social-psychological theory (or any other body of theory) can we justify hypothesizing that this characteristic of teachers is related to a given effect?"

Perhaps this point becomes clearer if we illustrate it with such a dimension of teachers as "interest in subject." This characteristic has been involved in many of the most extensive studies of teachers. Yet how can we hypothesize that the teachers' interest in his subject is important to his pupils' learning? If effect on pupils is in terms of such an objective as "to have an interest in this subject," then is the teacher's interest in the subject important by virtue of some kind of empathy with the teacher on the part of the students? Or are other processes of social learning and imitation involved? Or is the teacher's interest in the subject important only indirectly, for what it implies concerning other characteristics of the teacher, such as knowledge of the subject?

Our point is merely that in attempting to "spell out" the rationale underlying the hypotheses that a given teacher characteristic is related to some kind of effectiveness on the teacher's part we can achieve a better grasp of the assumptions underlying our research and practice if we use the best relevant psychological theory. We may then find ourselves compelled to develop more systematic and more adequate theory. Explicitly psychologizing our hypotheses concerning relationships between our variables should have a chastening effect on the kinds of research we attempt. And also our understanding of these relationships should then increase in more orderly fashion.

Integration with Other Research on Human Relations. Perhaps the foregoing statements about "psychologizing" would inevitably compel a kind of theorizing which would make teaching coordinate with other kinds of social process. Research on the teaching process might then become a part of a larger discipline integrating the scientific study of learning, socialization, group dynamics, human organization and similar processes.

In the initial phases of this scientific merger, research on teaching might well exploit concepts of other social phenomena that have been developed by students. For example, such notions as role, expectation, social norm, reference group, group cohesiveness, and social perception might be borrowed from the social psychologists and applied to the scientific understanding of teaching.

Inevitably, however, the relationship would become more symbiotic; the social psychologists, for example, might begin to incorporate in their conceptual frameworks such ideas as transfer of training, meaningful learning, and readiness, which have been used primarily by students of the teaching-learning process.

As such a unification movement progressed, a distinct science of teaching and ways of predicting the effectiveness of teachers would begin to disappear. We should acquire instead a general science of interpersonal relationships that would enable us to understand, predict, and control not merely teacher behaviors and effects but also clinician-client, foreman-worker, salesman-customer, officer-enlisted man, and parent-child relationships. That is, all interpersonal relationships in which we are concerned

primarily with the influence of one person's behavior and characteristics on another person's may then be subsumed under a unified and integrated discipline whose concepts and laws apply with equal validity to all the special interests.

And perhaps the next major step toward this goal should now be taken by those social scientists who are concerned with teacher effectiveness. To take this step, we would search such fields of study as group dynamics, psychotherapy, mass communications, group guidance, industrial supervision, and military leadership, for the concepts and principles they have developed which promise fruitful application to the phenomena of teacher effectiveness.

Let us consider just one example of the kind of transfer from other disciplines that we have in mind. Much has been said concerning the value of "clinical observation" of teachers' classroom behaviors for the development and testing of hypotheses concerning teacher effectiveness. Such observation has been carried out by some researchers, a notable instance being H. H. Anderson's work on dominative-integrative dimensions of teachers. But the use of this approach has been much less frequent and systematic than might be expected from the virtually unanimous agreement concerning its promise. In the field of "group dynamics," however, the actual development of observational technics has been much more prominent. An example is the work of Bales on interaction process analysis, which has resulted in the development of categories of social interaction in small groups, technics for observing and reporting social behaviors according to these categories, and promising attacks on the problems of reliability and statistical analysis of the data generated by these methods. "Interaction process analysis" is merely one of the many developments in other fields that might well receive serious attention from researchers on teacher effectiveness.

Measuring Teachers' Behaviors and Effects

Once the variables involved in teacher effectiveness have been specified thru systematic psychologizing, and the promising hypotheses concerning relationships among these variables have been formulated, we are faced with the question of "measuring" teachers' behaviors and effects. The problems of measurement in this area are, of course, basically the same as those of all educational and psychological measurement. We must seek for validity, and so for its two components, relevance and reliability. And, as usual, we are forced to be concerned with practicability in terms of time and money.

We can get a picture of the measurement approaches that have been taken in the past by looking at the classification developed by Domas and Tiedeman for their thousand-item annotated bibliography on teacher-competence.³ The classification reflects the fact that we can evaluate

³ Domas, Simeon J., and Tiedeman, David V. "Teacher Competence: An Annotated Bibliography." *Journal of Experimental Education* 19: 101-218; December 1950.

teacher effectiveness either directly, in terms of "pupils' achievement of educational objectives," or indirectly, in terms of "judgments of the teacher's demonstration of effectiveness" (c.f. measures of the teacher's behavior).

The pupils' achievement of educational objectives, which we have been calling the basic criterion dimension of teacher effectiveness, may in turn be measured by means of (a) objectively tested or observed performance or thru (b) subjective evaluations. The teachers' demonstration of effectiveness (behavior) may also be measured by means of (a) "objective" tests of "teaching ability," "teaching characteristics," and attitudes, or by means of (b) the judgments of various kinds of persons (superintendents, principals, supervisors, the teachers themselves, fellow-teachers, pupils, or lay persons).

Dependent Variables. The more "ultimate" criterion of effectiveness is pupils' growth and achievement (including "performance in life"). We can accept measures of teacher behaviors as criteria only when the behaviors have been demonstrated to have relationships to pupils' growth and achievement. In turn we generally prefer "objectively" observed performance as evidence concerning achievement because of the advantages in reproducibility and communicability of objective measures. Thus we arrive at the position most easy to defend but most difficult to attain. We shall seek to measure teacher effectiveness in relation to pupils in terms of the objectively measured achievement of pupils.

What we mean by "objectively" should perhaps be elaborated. An objectively observed performance is one that has been recorded in a form sufficiently permanent and accessible to qualified evaluators that their judgment concerning the performance is practically unanimous; examples are paper-and-pencil tests, motion pictures, or sound recordings of pupil behavior, that can be examined again and again by qualified judges and whose "scoring" can be made almost perfectly reliable.

That teachers' effects on objectively observed pupils' achievement is hard to come by is reflected in the relative scarcity of studies in which this criterion has been used; of the 1006 items in the Domas-Tiedeman bibliography, only 36, or 3.6 percent, were reports on the use of this difficult approach. Since the basic criterion dimension of teacher effectiveness is the most defensible one, the committee has no alternative but to recommend its increased use. This requires the development of more and more valid objectively scorable measures of achievement of educational objectives.

The measures themselves, if we are to realize on the principle that the dependent variable must be more sharply specified, must be more univocal so that we can trace more accurately the effect of teacher behavior. We shall need objective tests of knowledge and, within the area of knowledge, tests of knowledge of terminology, specific fact, methodology, theories and structures and the like. Similarly, we shall need

objective measures of appreciation, interest, attitude, and emotional and social adjustment, insofar as these are objectives toward which teachers seek to move their pupils. In investigating teachers' effectiveness in relation to school operations and community relationships to the school program, we shall need ways of measuring change in school programs and community relationships. This will lead us to become concerned with ways of "measuring" the productivity of teachers' committees, the cohesiveness of the teaching staff, the "morale" of the school, and in general the efficiency of the school's over-all functioning. Effects on communities will be measured thru surveys of community understanding, opinion, and participation *vis-a-vis* the schools.

Independent Variables. When we measure teacher behavior, we must also aspire toward valid "objective" tests, even tho ratings by principals, superintendents, or trained observers have great value for exploring dimensions of teacher behavior. This means that we need ways of recording and scoring teacher behaviors which will lead to practically unanimous agreement among qualified judges of the records. Obviously, those who seek to measure teacher behavior must join forces with those who are seeking to measure personality in general: the projective testers, the indirect attitude testers, the content analysis, the interaction process analysis, the measurers of diagnostic competence, and the like.

Intervening Variables. Similarly, when it comes to intervening variables, we must learn how to measure and evaluate those aspects of pupils, schools, and communities which may bear upon how they are affected by various teacher behaviors. For pupils, this means that researchers on teacher effectiveness will become involved with measures of social class, or previous educational experience for example, as well as with measures of previous achievement of relevant types of educational objectives. For school operations, this implies a concern with methods of describing, say, the social organization of schools, informal and formal patterns of influence among school personnel, or the social climate ("authoritarian" or "democratic") of schools. For community relationships to schools, this may mean a concern with culture patterns, patterns of influence in the community, communication channels, and the like.

Testing Hypotheses Concerning Behaviors and Effects of Teachers

After the categories of behavior and effect have been identified, the promising hypotheses relating behaviors and effects have been formulated and the procedures for measuring behaviors and effects have been developed, we are faced with perhaps the most fundamental question of all: what kinds of investigations, experiments, and other researches shall we carry out to subject our hypotheses to empirical test? This is a question of experimental design, or more broadly of general research strategy. On the wisdom of our solutions to this question probably depends the

realization of a science of teaching and for a scientific basis for such programs as teacher selection, training, and supervision.

Needed Experimentation. The committee first attempted to describe an "ideal" experiment for testing a simple hypothesis concerning teacher behaviors and effects. Such an experiment might go as follows: We select third-grade pupils who have one teacher and one teacher only for all of their school day for an entire school year. We select, as our dependent variable, a type of change in these pupils which can relatively easily be measured with high validity, such as spelling ability. At the beginning of the interval during which the pupils are under the influence of a single teacher, the pupils' spelling ability is measured, and teachers are assigned pupils who have exactly similar distributions of spelling ability. All other factors impinging on the pupils that might affect their growth in ability to spell are the same for all pupils under all teachers: for example, the social class, home environment, kinds of games that children play with their parents, mother's educational level, parent-child relationships, emotional factors. After all these factors have been controlled, the teachers go into action and on "September 15" begin trying to teach the children to spell. The teachers use the same teaching method; the same printed materials, such as textbooks, workbooks, newspapers, and the like; the same kinds of time schedules. The other activities that the pupils engage in are the same.

At this point we must specify the dimension of teachers whose relationship to growth in pupils' spelling ability is to be investigated. Let us say that we wish to allow the teachers to vary only in terms of the third logical step previously outlined in the teaching process, namely, the step of arranging for pupils to have the learning experiences formulated in step two and designed to lead to the achievement of objectives specified in step one. In teaching spelling by the use of "spelling-down" contests each day of the week, some teachers set up the contests as cooperative situations in which rewards and punishments are distributed to groups of pupils, whereas in other classrooms, these contests are set up as competitive situations, with rewards only for a few individual pupils. Teachers may also be allowed to vary say in their "dominateness-integrativeness." But the teachers will not be allowed to vary in how they carry out the fourth step in the logic of teaching, the evaluation of achievement nor in the fifth step, the reformulation of objectives in the light of experience.

At the end of the school year we obtain the mean spelling ability of the pupils under each teacher and this mean score constitutes the measure of the teacher's effectiveness. An illustrative conclusion might then be that teachers who behave integratively in competitive situations tend to have pupils with higher mean final spelling ability scores.

The foregoing "ideal" investigation could be still further refined. But the point should be clear that we cannot hope to carry out studies of this kind. It is impossible to control, statistically or experimentally, all

of the variables related to our dependent variables other than the specific independent variable under scrutiny. The variables are far too many, too complex, and too unmanageable for this kind of ideal ever to be realized. This fact creates the need for a variety of strategies if our hypotheses are ever to have adequate empirical substantiation.

Need for Intimate Contact with the "Data." One source of hope is that crucial insights will occur when educational researchers immerse themselves more thoroly in the primary data of the teaching process. Sitting in classrooms and letting the sights and sounds interact with apperceptive processes may give some workers the concepts and hypotheses with which to order the phenomena fruitfully. Freud in listening to his patients, Darwin in the voyage of the "Beagle," Kepler in examining the orbits of planets, Mendelyeev in poring over the properties of the elements, or Mendel in raising his peas—all had the common element of the scientist's living with his data. As one researcher has put it, "Love of the material has to be prior to love of theories."

Such intimate contact must be sought not only with the raw data of classroom observation. Research data also must be pondered over. We may well undertake to comprehend the "deviant cases" in our empirical studies, the cases in the second and fourth quadrants of our scatter plots. Almost no studies have been reported in which an attempt has been made to understand every last case in a relationship where r is, say, only .50. Yet such attempts, however *a posteriori*, can of course lead us to previously neglected variables for the sharpening of future hypotheses and to ways of refining our measurement devices. Instead of hesitating, we should encourage ourselves to discuss the reasons for the imperfection of our empirical results in testing hypotheses. Such reasons would amount to further hypotheses, to be accepted only after being tested empirically in their own right. But they may not even be developed unless we actively speculate, after computing the usual coefficient and significance tests, about why our experiments give us imperfect results, deviant cases, and unexpected values. Perhaps then we may come up with concepts as powerful as Freud's repression, Darwin's evolution, Kepler's elliptical orbits, Mendelyeev's periodic table, and Mendel's dominant-recessive distinction.

"Natural" Experimental Situations. The problem of controlling variables in studying teacher effectiveness arises just as acutely in "nature-nurture" studies. In the latter area much advantage has been taken of the existence of situations occurring "in nature" in which variables are either already controlled or easily subject to control. Identical twins, foster homes, isolated communities (i.e. canal boat children) are examples of these natural sites for research. In studying teacher effectiveness, there may be similar occasions for scientific opportunism. Among these may be the one-room school and the many-sectioned college course. In the one-room school, the children are relatively homogeneous as to social class, previous educational experience, concurrent educational opportuni-

ties, and similar factors. In the many-sectioned college course, as in one university which has 36 sections of introductory chemistry, the educational objectives, teaching materials, time allotments, and similar variables are often already held relatively constant. Measures of achievement, data on learners' aptitudes, and descriptions of teachers' behaviors and characteristics are also relatively easy to obtain. The committee suggests that research workers should be especially alert to the opportunities that such situations may provide.

Experimental Designs. What is the place of formal experimental design in research on teacher effectiveness? The educational researcher has an elaborate armamentarium of designs from which to draw: factorial design, Latin square, analysis of covariance, quality control, matched individuals and groups, and other arrangements which enable him to maximize the precision and sensitivity of his tests of null hypotheses.

As already implied, however, the difficulties in executing these designs are formidable if not often insurmountable. For example, we cannot always find the cases to fill in all the cells of our factorial design. We are seldom sure of what the important control variables should be. The labor involved in securing and measuring enough cases on enough variables to implement an elegantly designed experiment is prohibitive, unless we have a firm conviction *a priori* about the strength of our hypothesis.

As a result, we again arrive at the need for stronger hypotheses that will justify the cost of adequate experimental designs. And again the best hope seems to lie in the direction of more thinking, theorizing, and systematic psychologizing in intimate contact with the raw data of observation, and the research data from less costly exploratory investigations.

The resulting hypotheses will probably be so sharp and specific as to reduce greatly the number of variables involved. We shall in advance know more exactly what specific relationship between what particular aspect of teacher behavior and what specific type of effect we should hypothesize. The formally designed experiment will then be performed to demonstrate the hypothesis, not to develop it. And the deviant cases or unhypothesized results, will be examined in detail for clues to future hypotheses and refinements in measurement technics.

Next Steps

The committee developed some ideas as to its own future, the way in which AERA might continue to be concerned with criteria of teacher effectiveness, and how the profession at large might act in this area.

Perhaps this committee should be continued and asked to plan a program of studies. The committee might also be asked to arrange for the conduct of the studies. Or perhaps a new committee should be appointed by the AERA for these purposes. Or the planning and execution of studies should be delegated to individuals and organizations outside of the AERA; the latter to secure support from foundations and similar sources.

It was agreed that the future of the committee should be placed, along

with this report, before the AERA Executive Committee for a full discussion of all these alternatives.

Minority Report*

This committee was constituted as a result of my motion before the Association. That motion was made because I was close to problems which required for their solution more valid measures of teaching effectiveness and because I knew that many others had similar problems. I am compelled to dissent from the report of this committee primarily because I do not believe this report brings us any nearer than we were to the solution of the practical problems which research workers face in this area.

I think that the committee made an unfortunate choice early in its deliberations when it decided to define teaching effectiveness in conceptual terms rather than in operational terms. There may be no conceptual framework which is equally suitable for describing good teaching under any system of values. Even if there were, it is probably not a realistic way to approach the solution of the many practical problems which face us in the measurement of teaching effectiveness. Research workers will probably find this report too general to be of much help. In addition they will probably find in it formidable semantic difficulties.

This report presents a stimulating orientation in its categories of teacher effects. All of us would probably say that there were other orientations, however. For example, it might be very profitable to consider effective teaching behavior as a Gestalt rather than trying to break it down into elements. In presenting its orientation as *the* orientation, therefore, the committee is probably giving a wrong impression.

In my opinion, the most interesting and readable part of this report is the second part, in which suggestions are made for the design of experiments in the area of teacher effectiveness and the analysis of data in such studies. This is really apart from the purpose for which the committee was set up, however, and it is difficult to see that it contributes to the solution of the central problem.

As to the proper course for the Association to take at this point, my suggestion is that a new committee be named to study this problem further and that a suitable appropriation be made for this purpose. If the Association chooses, an alternative proposal would be to continue the present committee, with instructions that it pursue its deliberations further, in order that it may be able to present a more concrete and workable report.

* Prepared by Warren W. Cox.

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(The latest complete membership list was published in the December 1951 issue of the REVIEW. The following list indicates new members since that date.)

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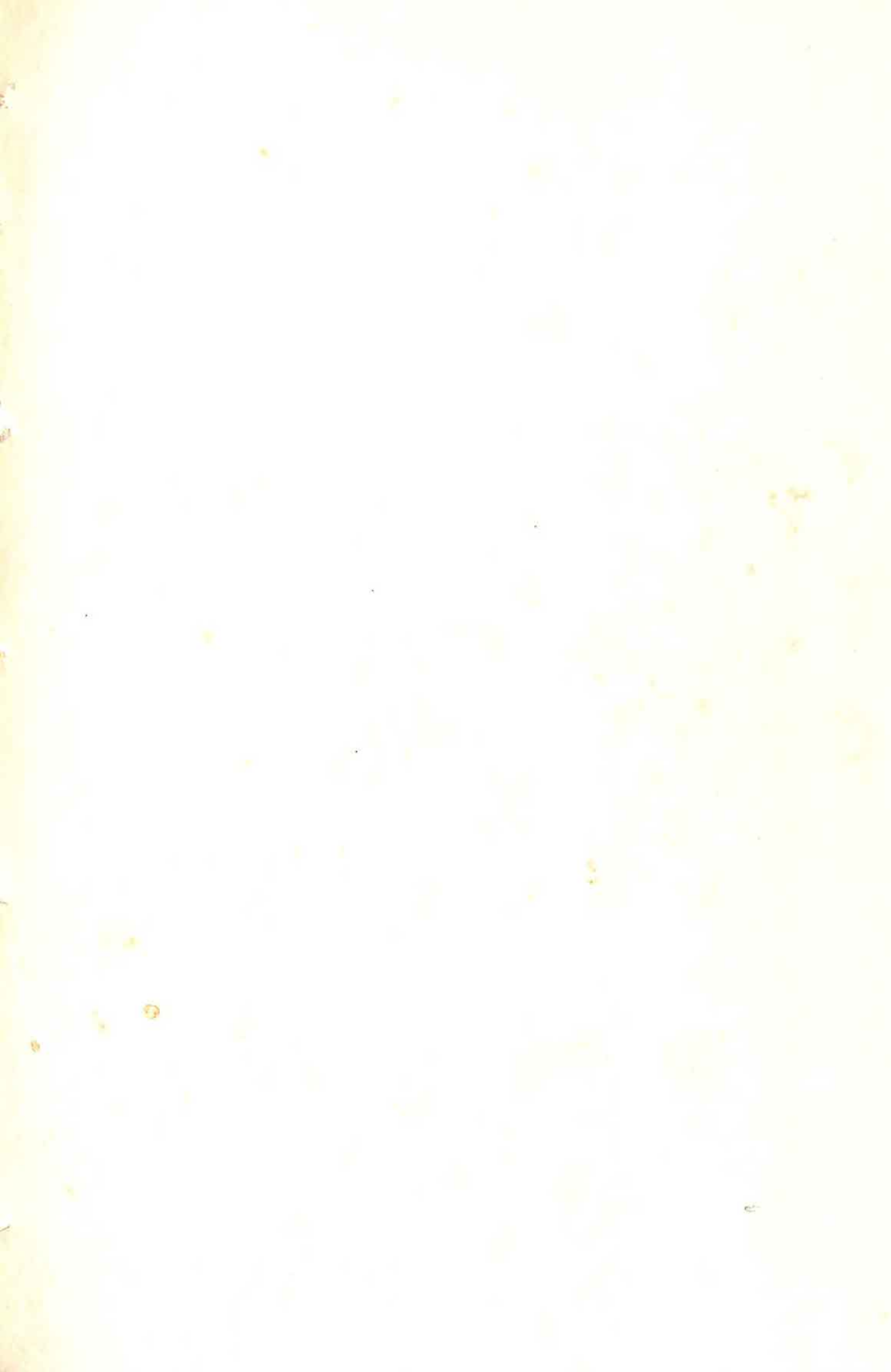
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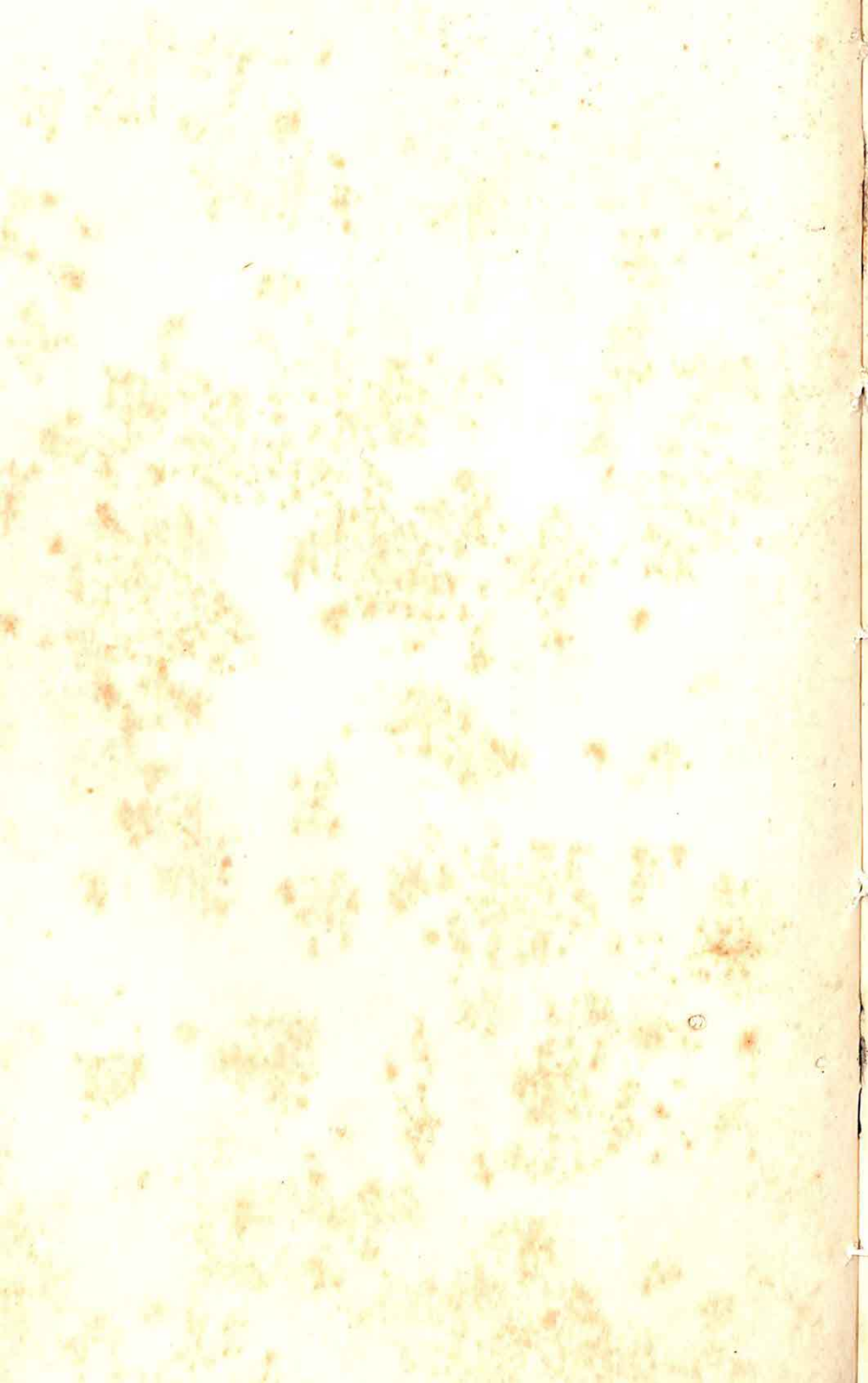
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INTRODUCTION

THIS is the eighth number of the REVIEW dealing with the topics of growth and development, altho, on recommendation of the editorial board, the subject has been broadened to cover more aspects of the psychological foundations of education. Because research on motor development has been light since the last issue, this topic was omitted. The literature on physical development is, however, extremely voluminous and comes from a number of diverse professional sources. Problems of mental development also continue to interest many workers, but the research tends to be scattered among minor and unrelated topics rather than to follow major themes systematically. The literature on aging is still primarily concerned with changes which take place in physical and mental attributes rather than upon attempts at adjustment. Research on personality development continues to be of much interest, but the nature of the studies is being more and more affected by psychological theory.

This trend in research is recognized in this issue by a departure from the past, namely, the devotion of two chapters to psychological theory and its effect upon research. It is obviously impossible to treat either of these aspects adequately within the limits of our space, but at least it is a beginning. Applied fields, such as education, are inevitably affected by theory; and it is interesting to see an increasing number of studies stimulated by and based upon some systematic approach to psychology. Greater sophistication on this aspect of research may lead to some fresh research approaches to old and baffling problems.

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CHAPTER I

Physical Growth

KAI JENSEN

THE term growth in both popular and scientific literature is used to cover a great variety of diverse and complex phenomena. It connotes all and any of these: reproduction, changes in dimensions, linear increase, gain in weight, gain in organic mass, cell multiplication, mitosis, cell migration, protein synthesis, and more (209).

Growth involves changes in size, shape, or function occurring in time. It may be studied at the molecular level, in cells, in a group of cells or tissues, in a specific organ or group of organs, or in an individual or population, or in some specific species (49).

Rates, patterns, directions, and causes of growth may all be affected by external and internal factors. These phenomena may be investigated at the documentary level of description or at the higher level of numerical formulation, analysis, and experimentation. Because growth is a process, research in this field can disclose not only the differences and similarities that exist, but also some explanation of how they come to be, together with possibilities of control.

Problems in growth vary with the developmental stage, and the growth potential may even become a liability as it does when normal growth in some tissue suddenly changes to uncontrolled, invasive neoplastic growth.

Because of the great number and variety of sciences which are interested in the study of at least some of the multiplicity of problems involved in understanding growth, and because of the fact that growth may be studied at such a diversity of levels by such a variety of methods and techniques, the literature is tremendous.

Reviews of the Literature

Splendid reviews of the literature dealing with some of the specialized problems of growth (91, 178, 201) have been published.

Wells (201) has reviewed 385 publications dealing with embryonic growth, embryonic induction, morphogenesis, development of function, ponderal growth, inhibition of development, developmental anomalies, postembryonic growth, genetic and morphological aspects of growth, growth equations, transplantation, tissue culture, regeneration, wound healing, nutrition, appetite, vitamins, effects of hormones, and inhibition of growth.

In the section on "Growth and Development" in *The Handbook of Experimental Psychology*, Carmichael (20), Hall (77), Nissen (143), Shock (168), and Sperry (174) reviewed the literature and made original contributions on the mechanisms of neural maturation, ontogenetic develop-

ment, the genetics of behavior, growth curves, and phylogenetic comparison. In the *Annual Review of Psychology*, Jones and Bayley (91) reviewed 38 publications on growth, development, and decline. In the *Proceedings of the Royal Society of London*, Haldane (75), Huxley (87), Medawar (125), Reeve (159), Yates (206), Young (208), and Zuckerman (209) critically discussed the accuracy of growth curves, relative growth and form transformation, transformation of shape, genetical aspects of size allometry, the place of statistics in the study of growth and form, the exact description of living organisms, and the pattern of change in size and shape respectively.

Blair and Burton (12), Merry and Merry (134), Reynolds (162), Sundgaard (182), and Thompson (188) have written new general texts on child growth and development which contain material on physical growth. Stuart and Reed (181), and Watson and Lowrey (199) have dealt with the general problem.

Gesell (55, 56) has written on developmental pediatrics and infant development, Forbes (43) on chemical growth, Leitch (108) has dealt with growth and health, and Osborn (148) with eugenics.

Several excellent sources of material on growth have been made available. Macy (120) has published a wealth of precise calculations for individuals and groups which should prove of value not only in nutrition research and child development, but also in the field of education. The data define growth patterns of individual children and make available computations of the original data of the Michigan study which many workers have desired.

Shuttleworth (171) has published 453 charts on growth and development designed primarily as a reference work for specialists in many different fields of child development. All of Section II is devoted to physical growth, but a large number of charts on physical growth will be found in other sections. The age range covered is from early childhood into adulthood. Another publication of Shuttleworth's (172) depicted normal changes in growth and development of boys and girls during the adolescent period by means of serial photographs.

Listings of current on-going research on growth and development are reported periodically by the U. S. Children's Bureau of the Federal Security Agency (40, 41). Another general source of much pertinent material is Cowdry's *Problems of Ageing* (27).

The Demographic Yearbook, 1949-1950 of the United Nations presented an interpretative report on world population trends over the last 30 years (195). It summarized current vital rates and age characteristics of the world by regions—population, births, deaths, marriages, and migrations.

Prenatal Development and Prematurity

Noback and Robertson (144) published data on the sequence of appearance of ossification centers for 136 human embryos during the first five

prenatal months. He found that most of the primary ossification centers appeared before the end of the fourth month and almost all of these between the seventh and twelfth weeks of embryonic life. He correlated his findings with published observations on human embryos in a series of tables.

Ellis and Lawley (36) correlated birth weight, crown-rump length, and head circumference in both full-term and premature infants with known gestational age. The correlations of birth weight and crown-rump length to week of gestational age in premature infants were found to be $+0.61$ and $+0.60$ respectively. In singleton premature infants of the same week of gestational age the correlation between any two of the three measurements was approximately $+0.80$. In full-term infants the correlations were highest between crown-rump length and crown-heel length, both of which correlated highly with weight. The correlation was smallest in the case of head circumference. The investigators suggested standards of prematurity as a birth weight of less than 2500 grams, a head circumference of less than 33 centimeters (13 inches), and a crown-rump length less than 32 centimeters ($12\frac{3}{8}$ inches).

Reardon, Wilson, and Graham (158) pointed out that 46 percent of neonatal mortality is due to prematurity. They also pointed out that 57 percent of the mortality of premature infants occurs during the first day of life. Deviations of the premature infant in regard to respiration, renal function, regulation of body temperature, cardiovascular system, skeletal system, and gastrointestinal system were discussed.

Howard and Worrell (83) evaluated the intelligence and personality of 22 premature infants at ages 1 to 19 years. They concluded that except for the condition of the eyes, prematurity does not seem to affect the physical growth adversely. Prematurity per se was found to have neither a beneficial nor a detrimental effect on intelligence except that a more than average percent of premature infants suffered intracranial hemorrhage as a result of being born prematurely. No relationship between degree of prematurity (birth weight) and IQ was found. Over half of their cases were found to have made unsatisfactory or below average personality adjustment as judged by personality test results and information gleaned from psychologic interviews and case histories.

Steiner and Pomerance (176) found that for a given weight group, the fatality rate varied inversely with the length of the gestation period, particularly in the case of infants below 1500 grams in weight. Premature infants of multiple birth had a lower over-all fatality. Another study by the same authors (177) reported that an inverse relationship existed between the length of a premature infant's gestation period and the time required to regain its birth weight and continue to gain (weight lag period). Mortality was found to be 63.3 percent in prematures of less than 29 weeks prematurity, but 21.5 percent in those of 34 to 37 weeks prematurity, where weights for the two groups were almost identical, but gestational age differed. These results certainly indicate the inadequacy of birth weight as the sole criterion of prematurity.

Taback (183) studied the relation between birth weight and length of gestation in 9000 babies born in Baltimore during the period January to June 1949. Clinical records of 662 white and 200 Negro mothers were also studied. This investigation showed that if small mature babies are to be excluded from the prematurity classification, criteria additional to birth weight must be used. Recommended additional criteria were length of gestation and racial and national group neonatal mortality experience.

Methods of securing uniformity in hospital statistics on premature infants in New York City were discussed by Wallace, and others (198). They defined the premature infant in the conventional manner as any infant born alive or cared for in a hospital for prematurity, whose birth weight or earliest known weight was less than 5 pounds, 9 ounces (2500 grams). Actually, of course, prematurity should be more rigidly defined since the conventional definition in terms of weight makes no allowance for the fact that a small child may be perfectly normal and not really premature and a larger child premature in spite of weighing the 2500 grams. This means that criteria such as length of gestation and other considerations should certainly be brought into the picture. Undoubtedly much of the confusion concerning prematurity arises from this hopeless intermingling of "normal" and "abnormal" under the definition usually used.

Vital Statistics

Neonatal Deaths. Neonatal deaths have been studied by Adair (1), Calkins (19), Evans (38), Fagan (39), Geiger (54), Gibson and McKeown (60, 62, 63), Gibson and McGarvey (64), Guthrie (73), Lancet (104), Le Masson and Martin (109), McKeown and Lowe (119), Marshall (122), Parrot (151), and Robinson (164).

Gibson and McKeown (60) found that mortality rates correlate highly both with duration of gestation and birth weight. No babies born before the end of the thirtieth week gestation and who weighed less than 2 pounds survived. The risk of death is still associated with duration of gestation and with birth weight after the end of one month following birth, though reduced greatly. The relationship between weight and mortality when gestation is constant is stronger than the association between mortality and length of gestation when weight is constant. There was a slight increase in mortality when the gestation period was unduly prolonged (for births of the same weight). Also for births after the same gestation period, the mortality rate was found to be slightly increased in the highest weight group (9 pounds and over).

Gibson and McKeown (62) also found that the stillbirth rate was higher in boys than in girls even when births in the same weight group were compared. In another study (63) these authors found that infant mortality increased with increasing birth order and decreased with maternal age and that in both cases the association was mainly the result of deaths from infections.

McKeown and Lowe (119) found that different causes of stillbirths have different sex ratios, and the proportionate contribution of each cause varies with the maternal age. They also found that the sex ratio of stillbirths increases as the duration of gestation increases from 49.8 at the seventh month to 57.1 at nine months and over.

The stillbirth rate is adversely affected by low social class and, broadly speaking, by advancing age after 25, by primiparity, and by increasing multiparity after the second child. The stillbirth rate is similarly affected by decreasing height (or more particularly, leg length) of the mother—a physical characteristic which in its turn is closely related to expenditure on food. Poor environmental conditions may well be more harmful to the reproductive function than more strictly obstetrical factors (104).

Mortality and Morbidity. Whereas in 1940-1942 the order of causes of maternal mortality in England was sepsis, hemorrhage, toxemia, and accident; in 1946-1948 sepsis was last in importance and toxemia had moved from third to first place. The maternal mortality rate was down to 1 per 1000 cases (103). Logan (111), and Webb and Weston (200) also reported on changes in causes of death in England and Wales.

In Louisiana between 1925 and 1949 maternal death rates decreased from 11.1 to 1.2 per 1000. Rates for nonwhite women were three times as great as for white. Puerperal toxemias and septicemias were still the leading causes of maternal mortality (109).

McCurdy (117) published a complete discussion of the medical, moral, and legal aspects of the Rhesus danger. Ranstrom (157), in a paper on the morbid anatomy of *erythroblastosis fetalis* and its relation to the Rh-factor, pointed out that if it be assumed that the endocrine disorders are a manifestation of the adaptation syndrome, and that they are the reason why the clinical symptoms do not begin till birth or afterwards, such assumptions reconcile the Rh-theory of the etiology of *erythroblastosis fetalis* with the pathological anatomy and the clinical cause of the disorders. Rh-immunization would then account for the whole morbid anatomy of *erythroblastosis fetalis*.

Cardiovascular disease and cancer now cause more deaths among children 5 to 19 years of age in the United States than all the infectious and parasitic diseases combined (92).

Birth and Early Postnatal Development

Carter and MacCarthy (21) studied the incidence of Mongolism and its diagnosis in the newborn on the basis of figures of births from 12 hospitals over a period of a few years prior to 1949. They found the incidence to be 1.5 per 1000 of live and stillborn children and pointed out that since the condition is less apt to be wrongly diagnosed than missed, the true incidence may be higher. The incidence in mothers below 25 years was very low. In mothers over 40 years it was more than 1 percent. The 1947 incidence for the general population in London, England, and Wales was estimated at 1.6 per 1000.

Gibson and McKeown (59, 60, 61, 62, 63), and McKeown and Gibson (118) in their thoro studies of 23,970 births in 1947 in Birmingham, England, dealt with survival, duration of gestation, birth weight, weight related to economic circumstances of parents, and effect of changing family size on infant mortality. Several studies of the weight of newborn children have been published (51, 76, 88, 165, 183).

Gavan (51) tested Meredith's biological generalization, that typically first-born neonates are lighter than later ones, by studying birth order and birth weight in 42 live born chimpanzees. He considered length of gestation period, maximum weight of the mid-parent, age of mother at conception, and ordinal of birth. He rejected Meredith's generalization on the grounds that it does not consider that the problem is essentially one of multiple causation. Gavan's analysis showed that in his population birth weight increased with increase in gestation period and with increase in maximum weight of mid-parent. It decreased with increase in mother's age. Increase in birth order decreased the gestation period but had no direct influence on birth weight. Halevi, Bromberg, and Brzezinsky (76) studied Jewish newborn in Palestine over the 1940-1945 period and concluded that psychological as well as economic factors influenced the intrauterine growth of the fetus.

Illingworth, Harvey, and Jawett (88) measured weight, standing and sitting height, pelvic girth, and chest and calf circumference in 238 children five to eight years old and compared them with birth weights. Children of the lowest birth-weight groups were found to be smaller in all measurements than those of the largest birth-weight group.

Scott, Jenkins, and Crawford (165) analyzed the birth weights of 11,818 Negro infants and compared them with previous figures. The relatively higher birth weights for one group were attributed in a large measure to more favorable economic conditions during the period of observation.

Parfit (150) studied the weight gain made by 1282 babies in the first year of life. Serial weight records were analyzed in relation to sex and birth weight. It was found that the rate of growth was greater for boys than for girls, and greater for small babies than for large. These differences appeared to result from the fact that weight increment (actual amount of weight gained since birth) was a function of sex but not of size (i.e., birth weight) and, other things being equal, tended to be the same for all babies of the same sex between the ages of one month and one year.

Data on nine aspects of the normal physical growth and development of 32 male and 26 female children at four-week intervals during the first year after birth were published by Thompson (189).

Norval, Kennedy, and Berkson (145) made biometric studies of the growth of 4111 children of Rochester, Minnesota, during the first year of life. They found mean weights generally higher than for other published studies. Scott and others (166) also reported on the growth of infants during the first year of life.

Mayer (124) published a critical review of history and legend from Aristotle to the twentieth century dealing with sextuplets and higher multiparous births. Nichols (142) published a paper on quintuplets and fecundity in which he reviewed 52 cases back to the year 1648. The cases involved 260 persons, of whom 127 were males and 133 females.

Growth—Anthropometric Measurements

Muhsam (137) correlated height and weight in early childhood for 147 male infants and found that children who are relatively big at a given age grow, during a given subsequent period, less than children who are relatively small at that age and that this condition held during the first four years of life. He found height at birth more closely connected with subsequent height and weight than weight at birth, and that children who are relatively tall at a given age subsequently grow less than those who are relatively small at that age.

Patrick (152) compared the heights and weights of Brisbane children in 1950 with measurements made in 1911 and found a considerable increase. He also found that at all ages in both sexes the children of professional fathers were taller and heavier than those whose fathers were of lower socio-economic status.

Moraut (135) studied secular changes in the heights of British people. He used measurements of men compiled on occasions between 1845 and 1948, a period which included about 2 million subjects between 18 and 50 years of age. He concluded that men were taller on the average at all adolescent ages than their ancestors were two generations ago, but that they become fully grown at a younger age and their maximum height is the same as that of their ancestors who matured more slowly. These conclusions were based on idealized age curves of mean heights for the general British male population about 1880 and about 1945. He further concluded that, because of the earlier maturity, the decline in adult life began earlier and so, after the early twenties, the people were shorter on the average than their ancestors.

Trotter and Gleser (193) studied cadavers ranging in age from 19 to 91 years and found a statistically significant decline of stature with age in each sample. They also reported on the trends in stature of American whites and Negroes born between 1840 and 1924 (194). The investigators raised the question as to whether changes in stature are progressive or cyclic.

Pirrie (155) found that between 1938 and 1949 the average height of London school children had increased by about 2 centimeters ($\frac{3}{4}$ inch) and the average weight by about 0.8 kilograms ($1\frac{3}{4}$ pounds).

Seils (167) found little or no relationship between the gross motor skill performance (running performance, balance, agility, jumping, throwing, striking, and catching) of primary-grade children and their age, height, or weight. A slight interrelationship was found between skeletal maturity and motor performance.

The weight-age and height-age curves for South African children were found to run consistently below those for European children with the disparity as regards weight becoming slightly more marked as age increased (204).

Cotellessa, Maranzana, and Soleri (25) reported on auxological research on 3500 girls from 6 to 18 years of age, and Cotellessa, Corradi, and DeMatteis (24) on 4000 boys for 6 to 18 years of age. Dossing (30) published average values for the weight-height-age ratio in boys and girls of school age.

Greulich (71) made an anthropometric and X-ray study of a representative group of children in Guam in the summer of 1947. He found that they were significantly retarded in standing height, sitting height, weight, and in their skeletal development as compared with a group of well-circumstanced white children of the same age in the United States. Guamanian boys were found to be relatively more retarded than girls in growth and skeletal status. Gavan (53) critically evaluated Greulich's methodology. Another study of children in the post-war world was made by Bacchetta (6) on the Italian child up to 1949.

Hahn (74) studied the relationship between blood pressure and height and weight and body surface area in schoolboys ranging in age from 11 to 15. Simple myopia in schoolboys in relation to body height and weight was investigated by Johansen (90).

Weight

Brozek and Keys (17) found that the concept of "normal" body weight defined actuarially, tends to obscure the profound changes taking place in the process of aging. Not only is there an additive accumulation of body fat but also, very likely, replacement of some of the muscle (and other "active tissues") by fatty tissues. They pointed out that in view of the variation in the composition of the body at the same weight and the differences in the metabolic properties of muscles and the deposited fat, the expression "per kg. of body weight" may lead to erroneous conclusions. The body weights of both of the groups they studied (19 to 25 years and 45 to 55 years) were "normal" but they differed markedly in the composition of the body as indicated by the amount of body fat measured from skin folds and estimated on the basis of specific gravity.

Massler and Suhrer (123) found chest circumference at the xiphoid level a very reliable index of weight when combined with height. Calf girth bore a specific and very close relationship to body weight, regardless of age. This measurement was also found to be directly and closely related to body build (somatotype) of the individual. They used 531 children $5\frac{1}{2}$ to $17\frac{1}{2}$ years in age and in maximal health and good nutritional condition as subjects. Gharpure and Jhala (58) studied the relationship of the body weight to the weight of the brain.

Armstrong, and others (4) studied the relation of obesity to health and disease. They defined obesity as a deviation of 20 percent or more

over the ideal weight. They concluded that obesity makes pregnancy more difficult and both mother and child are affected (diabetes). They also concluded that obesity should be attacked as a public health problem because of its extent and the fact that it shortens life and is an etiologic factor in several diseases.

The present status of the obesity problem, diet management of obesity, thyroid medication, and appetite depressants were discussed by Barborka (8).

Body Size

Ellis (35) outlined the phases of postnatal growth and showed that they do not consistently correlate with chronological age. He emphasized the importance of a maturity grading during the period of growth and pointed out that the Education Act and legislation for the protection of employed juveniles in England do not evidence any awareness of this, but rely too much on chronological age.

Lawson (107) described eight measures of body size on girls of two racial groups living in Compton, California. Measurements of infants at birth were described by Low (113).

Meredith and his associates have dealt with various aspects of body size and form in a series of publications (127, 128, 129, 130, 131, 132, 133). He arranged data in order and determined the 10th, 30th, 70th, and 90th percentiles for body size norms for children four to eight years of age (127). Fourteen previously characterized groups of United States white school boys were compared with white boys of elementary-school age living in the Northwest region of the United States who had been assessed by anthropometric methods (129). Meredith (128) also published a synthesis of 12 studies concerning present knowledge on the association between socio-economic level and body size for the period of middle childhood in the United States and London. He concluded that information presently available for this group indicates that North American boys of the indigent class probably are more than 2 inches shorter and 5 pounds lighter than those of the wealthy class and that girths of trunk and limbs, breadth of shoulders and head, and length of extremities were greater in children of the professional and managerial occupational groups.

Meredith and Culp (130) found that for the age range from four to eight years in boys there was a gradual decrease in the stockiness of stem, stockiness of upper and lower limbs, and over-all stockiness of the body. They found low correlation coefficients between stem stockiness and lower limb stockiness (+.26 to +.53) and only moderate correlation coefficients between stockiness of upper and lower limbs (+.68 to +.77). A companion study on girls uncovered central tendency values indicating that girls become more slender in body-stem over the age period from four to seven years and more slender in upper and lower extremities of the age range from four to eight (133).

Meredith and Goldstein (131) studied body size of North American children of Mexican ancestry from birth to 17 years during the temporal span between 1924 and 1951. Differences in means associated with geographic region, socio-economic level, and secular period were found. They suggested that research is inadequate or lacking on all problems of body size in the age period one to four years, dispersion of measurements of body size at most ages, and individual variations in growth pattern and growth rate for all dimensions.

Meredith and Meredith (132) published annual increment norms covering the age period from four to eight years for 10 measures of physical growth. They described the source and size of their sample, the anthropometric procedures followed in the collection of the basic data, and their methods of increment derivation and norm construction. Illustrations suggesting some applications of the norms were given.

Newcomer and Meredith (140) used 11 measures of body size on a sample of 102 15-year-old white boys as a part of a long-term research to study physical growth of children in Oregon. They compared their results with those of other studies.

Steroid Phase of Growth

Gallagher (45, 46), Stolz and Stolz (179), and Reynolds and Wines (161) have published good general discussions of growth and development during the steroid phase of growth. Precocious puberty has been dealt with in 37, 110, 136. Engstrom and Munson (37) described two brothers who exhibited precocious sexual and somatic development and contrasted them with a third brother, intermediary in age, who showed no developmental abnormality. Another boy who also was precociously developed and who suffered from adrenal cortex overactivity was also studied. In examining the sequence of the maturity phenomena, it was seen that the general picture of growth in height and weight was like the adolescent "spurt" in growth of normal boys except for its occurrence at an abnormally early age. The skeletal and muscular systems responded in a fairly normal manner to accelerated growth factors, but some other phenomena, such as the 17-keto-steroid secretion, were below that of normal boys of comparable biologic age. Teeth and the central nervous system were largely unaffected by the influences which caused precocious puberty. Normal pubescence did not occur.

Lloyd, Lobotsky, and Morley (110) examined five cases of probable hypophyseal precocious puberty of constitutional origin and one case of hypophyseal precocious puberty associated with a hypothalamic lesion. He briefly discussed the physical alterations involved.

Garr (49) claimed that contemporary American children sprout breast buds, pubic hair, axillary hair, and attain menarche from one to two years earlier than was formerly true. He also pointed out that this was the case in England, except that earlier puberty there is thought to be

accompanied by an earlier cessation of growth, so that English children mature earlier and stop growing earlier.

Evidence purporting to show that physical constitution must influence reaction patterns was published by Bayer and Reichard (10). They studied 42 women at the Stanford Androgynic Clinic and classified their subjects into seven androgynic groups: hyperfeminine, feminine, hypofeminine, hypobisexual, bisexual, masculine, and disharmonious. In addition they used intensive interviews, administration of Stanford Binet vocabulary, and 10 of the TAT pictures. Where sexuality was weak, they reported a tendency toward the renunciation of personal relationships and oral gratification. A masculine direction in androgyny favored muscular activity and independence.

Bayley (11) worked with a group of normal adolescents and found the androgynic variables in body form to be significantly related to strength and in some degree to weight. She also found the hypomuscular boys to be significantly taller than the hypermuscular boys. Intelligence was found to bear no relation to sex variable either physical or mental, with the possible exception of the boys' IQ's with Kuder masculinity-femininity scores. She concluded that tho there were some tenuous indications of relation between the masculine and feminine in physique and interests, the outstanding fact in these adolescents, in particular the girls, was that the two series of variables were largely independent of each other. She concluded that somatic androgyny was only one of a multiplicity of factors which may influence the direction of a person's interests. Furthermore, such relationships as did occur were not in the expected direction, along a single masculine-feminine continuum. The Kuder MF scores of the cases in the atypical somatic classification were accounted for by such factors as the age of the subjects and their culturally-conditioned emotional attitudes toward their own physiques.

Shuttleworth (171, 172) has published both a graphic atlas of the adolescent period and a pictorial atlas. Both of these publications should prove of great value to workers in the field as very fertile sources of information. Stolz and Stolz (179) have also published a volume which contains 113 tables and over 200 gross profile charts, histograms, and diagrams. It also contains photographs which show the progressive development of several boys involved thruout the period of this study. In addition there is a detailed case history of one of the boys demonstrating the relationship between physical and social growth and development. Waite and Rothschild (197) have published a review of normal growth and development in the adolescent for the pediatrician. Latham (106) evaluated the relationship between pubertal status and leadership in junior high-school boys. Another study of this sort was that of Hanley's (78), which was concerned with physique and reputation of junior high-school boys. Hanley found associations between physique and reputation which seemed congruent with Sheldon's hypothesis insofar as the kinds of relationships were concerned. However, Hanley's relationships nowhere approached the

magnitude of those Sheldon reported between temperament and physique. Murray (139) advocated the assessment of physiological age by a combination of several criteria: vision, hearing, blood pressure, and muscle force.

Endocrine Regulation of Growth

There has been an extraordinary output of literature in the field of endocrinology. Wilkins' (203) book on the diagnosis and treatment of endocrine disorders in childhood and adolescence dealt with the relationship of endocrine factors to growth and development, endocrine study and diagnosis in general, and the major endocrinopathies (except *diabetes mellitus*). One excellent feature of this publication was the vividness with which the author displayed the extremes of normal variance of adolescent development.

Kountz (100) found that estrogen and androgen could revitalize certain tissues associated with age. Along with the direct effect on these tissues he found some retardation of both the mental and the physical decline.

Caldwell and Watson (18) studied the effects of six months of sex hormone administration in aged women. They used psychologic tests as a criterion and found improvement in memory and intellectual functioning as well as a change in the motivation level of the patients. They did not discern any significant changes in pattern of interests and attitudes. Memory was definitely enhanced, particularly in respect to meaningful and logical material. Over the six-month period the experimental group made distinct gains in the learning of new material, even when this required the breakup of old associations which had long held sway.

Body Segments and Tissues

Peacock (154) published work dealing with the prenatal development of intervertebral discs in man. In addition to the data of prenatal development, he presented data on intervertebral discs at various ages following birth (153). Descriptions were given of the tissue changes taking place in the structural components of the human intervertebral discs from birth to 80 years of age.

Tirman and Hamilton (190) published measurements of the thorax and its viscera and indicated the changes which occurred with age in apparently normal men. They found some features which remained unchanged.

The embryonic development of the human knee joint was described by Gray and Gardner (69), and O'Rahilly (147) also published some work dealing with the early development of the human knee joint.

Lombard (112) studied the development of the calf of the leg by means of a roentgenographic technic. The breadth of the tissues in the calf of the leg was found to vary with the age, sex, and body build of the child. Norms were presented by which the measurements for individual children

could be compared with those for a large group. They concluded that it is important to differentiate weight into its component parts of muscle, bone, and fat. This they attempted to do by measuring the thickness of the skin and subcutaneous tissue and the breadth of bone and muscle on A-P roentgenograms of the calf.

Jager and Moll (39) studied the development of the human *triceps surae* muscle in embryos, stillborn fetuses, and adults. They paid special attention to the development of muscle architecture and skeletal attachments.

Duggins and Trotter (32) studied the age changes in head hair from birth to 14 years of age. Trotter and Duggins (192) also published work dealing with age changes of head hair from birth to maturity. Garn (48) pointed out that the many differences in methods of studying hair texture make comparisons of published ratings unwise. Cranial growth was studied by Pankow (149). Gunther (72) studied the developmental changes in jaw length. The head-jaw-index is a measure of jaw length as a percent of the length. The head-jaw-index is a measure of jaw length as a percent of the distance (vertical) from the highest point on the head to the upper edge of the ear opening. It increases rapidly during prenatal development.

Fulton (44) compared dental caries in New Zealand and the United States on the basis of decayed, missing, and filled teeth for children aged 12 to 14. Garn and Coenraad (50) found tooth emergence markedly advanced in Aleutian Aleut children as compared with whites. They also found no growth retardation or stunting as a result of the wartime experiences of this group. This was especially true for the younger children who were most advanced in tooth emergence and who exceeded their expected stature markedly. These children suffered markedly during the war. Mellanby and Mellanby (126) found slight improvement in dental disease among 14-year-old children in England in 1947 and 1950. Woods (205) studied changes in width dimensions between certain teeth and facial points during human growth. Andrew (2) compared age changes in salivary glands in man and the rat. He found a very great degree of fatty replacement in old age in the case of the parotid gland and less in the submandibular gland. Accumulations of lymphoid tissues were as common in the salivary glands in old age in man as in the rat. This increase in the percentage of fat was believed to be a destructive one.

Covell (26) made histologic examinations of the cochlea of the ear in aged subjects with severe nerve deafness. These failed to demonstrate a close relationship between structural changes and the degree of hearing loss.

The development of the nervous pathways in the developing human labyrinth was studied by Shute (170). Keeney (96) published developmental data on the eye. The brain was studied by Connolly (23). For the most part he made a detailed presentation by description, photograph, and line drawing of the fissural pattern and convolutions of the primate brain. Hogue (81) cultured brain cells including neurons and oligodendroglia *in vitro* after death of the individuals. She worked with 121 brains of fetuses from 16 millimeter C-R length to stillborn infants and brains from

two infants that lived one day and five months respectively. Some of the tissue cultures studied were made long after the individuals were pronounced dead. The time elapsing from death to the making of the tissue cultures varied from less than one hour to nine days. Some of Hogue's cultures survived more than 323 days. This proof that brain cells may live after "death" calls for drastic revision of some concepts concerning the nature of brain injuries and general growth and development of the central nervous system.

Sperry (174) reported on the studies which have been made of neural maturation. Young (208) published work on the growth and plasticity in the nervous system. He tackled the question of what happens in the nervous system at each presentation of the learning situation.

His experiments showed that there may be large increases and decreases in the size of cells and fibers over periods of days, weeks, and months. Because of this he concluded that it is not unplausible to suppose that at the level of the dimensions involved in synaptic function, changes of much smaller amount could occur in the periods of seconds, minutes, hours, and days that are involved in the establishment of a learned response. He further concluded that the changes during functioning could be sufficient to alter the probable course of excitation within the nervous networks and thus provide a stable basis for learned reactions.

Edwards (34) studied differences in the distribution of subcutaneous fat with sex and maturity. He found that up to puberty the sexes are similar in the pattern of fat distribution and that pregnancy and obesity have little effect on the relative distribution of fat.

Bliss and Young (13) analyzed the heart measurements of growing boys. They made measurements of the transverse diameter of the heart from periodic roentgenograms of growing boys and examined them statistically in relation to measurements of body size. They found that heart diameter could be predicted more efficiently from body weight than from either height or a combination of height and weight.

Tähkä (185) published data on the weight of the thyroid gland in 244 children of zero to 2 years of age. She found that the thyroid gland decreased to about 68 percent of newborn weight at two to three months. There were no sex differences. Tähkä (184) also studied the weight of the thymus of 309 children, finding again no sex differences and no discernible effect of age on size.

A direct correlation between the weight of the thyroid gland and age and body weight of the animals they observed was found by Mulligan and Francis (138). No such relationship was found between the weight of the parathyroid gland and the age and body weight.

Andrews (3) made a histological study of 66 prostates removed from infants and children between the twenty-fourth week of fetal life and 13 years of age. He discussed the possible etiology of these changes and their relationship to benign hypertrophy.

Areolar size was studied by Garn (47) during the steroid growth phase in 147 children from 9 to 20 years of age. He found areolar size genetically limited and independent of size. Furthermore, he found no increase once the mature stage is reached.

Wagner (196) dealt with the nonendocrine deviations from the normal pattern of osseous development. Skeletal age in diabetic children was dealt with by Hernberg and Herkel (80). They found no definite relationship between the duration of disease and the abnormal variations.

Somatotypes—Body Build—Constitution

Barbara (7), Bauza and Solovey de Milechnin (9), Dupertuis (33), Hanley (78), Howells (84, 85), Hunt (86), Newman (141), Reynolds and Asakawa (160), and Spray and Widdowson (175) have all reported research dealing with somatotypes.

Dupertuis (33) reported that anthropometric measurements on the living were only moderately successful in demonstrating anatomical differences between extreme somatotypes and that they were of questionable value in differentiating between the midrange and closely related somatotypes.

Howells (84), Hunt (86), and Newman (141) have all raised important questions about Sheldon's somatotyping. Howells (84) raised questions as to the essential nature of the components, the nature of the genetic element, developmental latitudes and determinants, and the extent to which the accepted phenomena grew out of the hypothesis itself.

Hunt (86) concluded that it was safer to assume that a body build photograph represented a momentary state in the somatic biography of an individual than to attempt to find ratings of body build which were constant thruout life. An unimpeachable basis of constitutional knowledge may some day be provided by the arduous study of photographs at successive stages of the human life cycle and the measurement of trajectories of individual growth and aging.

Newman (141) investigated the problem of stability in body build by examining a series of some 40,000 individuals photographed by the United States Army and typed at Harvard University. The age groups from 18 thru 35 years were analyzed for percent of occurrence for each rating, mean component scores, summation of component scores, product-moment correlation coefficients, and partial correlation coefficients on a year by year basis. Comparisons of central tendency and statistical association on series typed by the Hooten system and series typed by the Sheldon system showed large differences between investigators. These differences posed problems of comparability of technics.

Reynolds and Asakawa (160) used roentgenograms of the leg in 100 men and 100 women, ages 19 to 70 years, to measure breadth of fat, muscle, and bone. They also measured weight, height, and calf circumference, took photographs, assessed androgyny on selected cases, and picked out extremes of endomorphy, mesomorphy, and ectomorphy. Intercorrelations

between tissue breadths were low. Tissue breadths correlated significantly with weight, but not with height. Age was not an important factor in their series, as measured by the correlation coefficient.

Reynolds and Wines (161) studied the relation of body build and growth progress in weight and height to sexual maturation, basing their conclusions on 706 semiannual examinations of 59 boys. Their observations were chiefly descriptive and classificatory in nature.

Kahn, Brown, and Goldring (93) made a Wetzel Grid analysis of 157 children in their initial episode of acute rheumatic fever and found definite growth failure in this series as compared with the distribution of 3366 grade-school children. Marked improvement in growth and development occurred in 130 of the 157 rheumatic children in follow-up studies. (The 130 were the only cases where follow-up studies were available.)

Special Environmental Effects

Operation on the Brain for Feeble-mindedness. The Carotid-Jugular-Anastomosis operation was designed to increase cerebral circulation in order to improve the mental abilities of retarded children as well as to produce other beneficial effects in children and adults suffering from some such physical disabilities as convulsive disorders and sensory-motor impairment. In one of the most complete reports to date Kessler (97) evaluated the results of the C-J-A operation on 33 children and concluded that there is virtually no evidence substantiating the effectiveness of the operation.

Socio-Economic Status. Douglass (31) made a national survey of social class differences in health and survival during the first two years of life and found a distinct social gradient.

Bransby and Hammond (15) compared groups in respect to socio-economic status and clinical nutritional categories, and the "good" groups in each case showed quite different characteristics. The good socio-economic group excelled mainly in length measurements but had less fat; the clinically good groups excelled in girths and fat. They concluded that physical type evidently needed to be taken into account within the social and clinical groups.

Comparisons of actual and predicted weight, together with fat measurements were deemed promising, but they believed that no one method offered a real solution, the safest approach being to use all available methods in conjunction.

Nutrition. Macy and Hunscher (121) studied calories as a limiting factor in the growth of children. They found that invisible growth occurred with progressive maturation and could be measured indirectly by various technics: (a) by the absorption and storage in the body of structural and functional constituents obtained from food eaten, (b) by basal metabolic rate determinations, (c) by other physiologic measurements, and (d) by roentgenographic recordings.

Bransby and Hammond (16) made an interesting study on the relia-

bility of the clinical assessment of "nutritional state." One hundred children were examined by nine clinicians and a school nurse. Nothing was known by the clinicians of the children's backgrounds. The agreement among the clinicians was rather poor. Moreover, when some children were rated twice by the same clinician, considerable variation (from 4 to 37 percent) occurred.

Widdowson (202) studied children ranging in age from 4 to 14 years in two German orphanages to ascertain the effect of emotional climate upon physical growth. She found that psychological stresses due to harsh and unsympathetic handling seriously curtailed growth rates.

An interpretative review of 1008 publications dealing with maternal and infant mortality, specific nutritional factors in maternal and infant health, prematernal, prenatal, and postnatal care was published by Toverud, Stearns, and Macy (191). They repeatedly emphasized the importance of social factors but did not analyze the kinds of social influences which lead to death.

Starvation. Several excellent and extensive studies of starvation are available (98, 114, 173).

Keys and his co-workers (98) studied experimentally the effect of controlled semistarvation upon human body structures and tissues. Fourteen bodily measures were taken. The effect of semistarvation on growth and development was thoroly surveyed in Volume 2. They also reviewed the general literature and offered evidence that dental disease (caries) was less frequent in semistarved populations and that semistarvation had no influence on the duration of pregnancy. Labor averaged 5 hours shorter in better-fed mothers, and there were fewer congenital malformations. The amount, timing, and rate of postnatal growth in height and weight were found to be adversely affected. Weight was not handled as a discrete or unitary measurement in this study but was broken down into its basic components. McCance and his colleagues (114) made a very extensive study of undernutrition in postwar Wuppertal, Germany. Smith and Woodruff (173) studied deficiency diseases in Japanese prison camps where they were inmates. All three studies showed that, at least within broad limits, no irreversible changes occurred. These three studies give a clearer insight into the effects of semistarvation than any other publications to date.

Studies conducted in Britain, Holland, Switzerland, and France showed little or no effect on height and weight of children as a result of a decrease in food supply. Such delays in growth as did occur seemed completely reversible. In the case of France it was claimed that "microclimatic" differences were much more stable than differences due to undernourishment (146). This is in agreement with findings from studies in Germany and Japan (105).

Fate of Transplants

Fleming (42) reported that transplants of human tooth germs grew better in guinea pigs than rabbits. The fact that tooth germs survived

intraocular transfer offered a new approach to further studies of their growth and development.

Harris and Jacobsohn (79) studied functional grafts of the anterior pituitary gland and found that such tissue obtained from immature donors and grafted into adult recipients showed hastened development. Similar tissue obtained from adult male donors and grafted into adult female recipients proved capable of maintaining normal oestrus cycles and pregnancy.

McCay and others (116) pointed out that healing of wounded tissue which is slowed in older individuals proceeded at the same speed as for younger individuals if the tissue was excised and permitted to heal *in vitro*.

Some of the outcomes of transplantation experiments raised the basic question of the importance of knowing more about the chemical and endocrine components of cell environment. What caused the speedup of the development of tissue transplanted from a younger to an older animal? What caused the slowdown in the reverse situation? What produced optimal *inter* and *intra* organ development?

Methodology and Technics

The merits of the pure longitudinal, the mixed longitudinal, and the cross-sectional growth studies with the necessary inferences as to the statistical handling of each type of data were thoroly discussed by Tanner (187). He pointed out that the ratio index was one way of describing the growth of one part of the body relative to another whereas in the allometry equation, multiplicative velocities of two dimensions were compared. Tanner also discussed the relationship between allometry during growth and the factor analysis of adult physique.

In another publication Tanner (186) discussed the theoretical background and limitations of current standards available for determining whether or not a child is growing normally. He pointed out that the limits of normality are usually fixed arbitrarily according to the purposes at hand with misclassification resulting. The merits of standards in terms of percentiles and in terms of deviations were discussed and various standards of maturity were reviewed. The limitations in using standards for distance as tho they were standards for velocity were mentioned. A suggested system of standards was presented for experimental trial, and various measures were considered in relation to age and to each other irrespective of age. The difficulty in interpreting multiple tests of this sort was stressed.

Zuckerman (209) discussed in general the measurement of growth and form, Haldane (75) the accuracy of growth curves, Huxley (87) relative growth and form transformation, Medawar (125) form transformation, Reeve (159) genetical aspects of size allometry, Yates (206) the place of statistics in the study of growth and form, and Young (207) the exact description of living organisms. These papers dealt with the topics indi-

cated at a very high level. Stuart and Reed (181) discussed certain technical aspects of longitudinal studies of child health and development. They considered the question of how to interpret over-all growth of the body in terms of the growth of different types of tissues and also how to summarize the facts concerning growth over a period of time. Stuart (180) dealt with the problems in applying knowledge of child growth and development.

Greenberg and Bryan (70) used the method of co-variance in studying physical growth and found it was equal to doubling the number of observations. They recommended that the technic of co-variance be employed in the analysis of anthropometric characteristics of school children. They considered the problems involved in obtaining physical measurements in the optimal age group for study and the physical measurements which might be worthwhile indices for adoption.

House (82) used the questionnaire technic to ascertain the opinion of 49 radiologists as to the age limit of apparently normal six-year-old children. Little agreement as to the lower skeletal age limit for normal six-year-olds was found.

In another publication, Howells (85) stressed the need for further analytical technics especially statistical ones in anthropometry. He discussed factor analysis as one such possible technic. Keen (95) proposed a program of standardization for the technic of cranial capacity determination. Koch and Kaplan (99) presented a method by which the trend in body development (height-weight) of children could be found for smaller numbers than the Wetzell grid method, for example, could handle.

McCance and Widdowson (115) have published a method of breaking down the body weights of living persons into terms of extracellular fluid, cell mass, and fat, together with some applications of their method to cell mass, and fat, together with some applications of their method to physiology and medicine. They thought their method would help to solve a number of physiological, nutritional, and medical problems and throw light on development during childhood and adolescence.

Spray and Widdowson (175) studied the concentration of protein, water, fat, sodium, potassium, calcium, magnesium, phosphorus, iron, copper, and zinc in the bodies and livers and spleens of rats, rabbits, cats, and pigs from birth to maturity. Mice and guinea pigs were also studied during the early part of their lives, and the results were compared with corresponding figures for man. They concluded that Moulton's conception of chemical maturity is not a true generalization and requires elaboration if it is to be applied in detail. Chemical growth of man was dealt with by Forbes (43) and Macy (120). Forbes pointed out that from mid-fetal life to the period of young adulthood, chemical growth as regards Na, K, and H_2O proceeds in a way that it conforms to the differential growth equation $y = bx^k$.

Gesell (57), Price (156), and Rife (163) have all considered methodological problems in connection with the co-twin control method. Price

(156) in particular carefully considered primary biases in twin studies and critically discussed the use of the twin method in studying the nature-nurture problem. The segregation of genetic factors from intra-uterine factors may be accomplished in part, at least, by using embryos which are obtained by transplantation procedures.

Garn (49) has pointed out that both older and more recent investigations agree that the nature of the injurious stimulus is of less importance than the time of its application. Other studies indicate that there seems to be a definite trend toward the "range of normality" concept as contrasted with fixed points for normality (68, 186, 187, 203).

Krogman (101), has suggested a program of cooperative research involving physical growth with orthopedics, pediatrics, dermatology, ophthalmology, obstetrics, general medicine, medico-legal research, aeromedical research, orthodontics and prosthetics, oral surgery, and children's dentistry. When interdisciplinary approaches are used the experimenter often accepts at face value instruments outside his field which are too imperfect, or attaches too great significance to them.

Blum and Fieldstell (14) have objected to the use of broad descriptive terms such as "making progress" with respect to children under treatment. They presented a method of charting the rate of a child's progress concurrently with treatment so as to furnish a basis for determining the extent to which treatment was effective. They believed their technic could be used with almost any kind of retardation or disability. Gordon (68) dealt with the problem of determining which diseases in children warrant treatment. He listed a number of "disorders" which usually do not require treatment because they are innocuous (enlarged tonsils, orthopedic defects, phimosis, constipation, innocuous cardiac murmurs, etc.). He criticized the perfectionists' definition of health as well as the functionalists' definition.

Ciocco and Ring (22) discussed criteria for field study and presented them in outline form. They were concerned with objectives, the validity and reliability of measuring instruments, control groups, staff qualifications, and follow-up procedures. DeToni (28, 29) proposed a simple auxometric grid for the evaluation of human growth and its application in scientific and clinical areas.

Dupertuis (33) tried to discover just how different groups of extreme physiques are in terms of conventional anthropometric measurements and reached the conclusion that such measurements were only moderately successful in demonstrating anatomical differences between extreme somatotypes and were of questionable value in differentiating between the mid-range and closely related somatotypes.

Massler and Suhrer (123) measured weight, height, chest, neck, and calf circumference and made subjective estimates of somatotype on 304 boys and 227 girls aged from $5\frac{1}{2}$ to $17\frac{1}{2}$ years. They presented a channel diagram similar to the Wetzel Grid for the determination of body type in children on the basis of the constant relationship between height and calf

girth which they found. They claimed that their method of channelization had the advantage of indicating inherent or "normal" body build rather than the "present status" indicated by the Wetzel Grid.

Gavan (52) found considerable variation in 62 anthropometric measurements taken by six teams on five subjects. Gobessi (65, 66, 67) suggested an auxometric reticulum for graphic representation of growth and also some methods for the automatic application of the DeToni Auxological Classification. Ashley-Montagu (5) has presented a number of methods used in anthropometry.

Growth Curves and Growth Formulas

The primary use of a growth curve is to estimate the amount and rate of growth. It is also used to study the effects of diet, the effects of hormones, seasonal variation, equivalence of growth among different species, and problems of relative growth (49). In constructing and using growth curves they must be disentangled from "frequency distribution" in size. Shock (168) has critically evaluated the current literature dealing with growth curves. Growth equations expedite the analysis of growth rates, allow comparisons of modes of growth of related organisms, and make it possible to frame inductive "laws" of growth. The allometry equation deals with differential or relative growth. Empirical formulas resulting from fitting to the data are descriptions of those data, and extrapolation is perilous. Moreover equations derived on a priori grounds may obscure important factors. No one biological law underlies growth equations (169).

A new method of estimating differential (allometric) growth gives greater accuracy than the older methods (75). By means of "shape parameters" (ratios, if the growth is isometric) and allometric constants, growth profiles of an organism may be constructed.

Medawar (125) considered the measurement of transformation of shape. His method was analytic and described continuous changes of shape. It did not apply where changes of complexity were involved, and he pointed out that to date no adequate method for describing change of complexity has been produced.

On the basis of height and weight measurements of 440 healthy children in a favorable environment who were followed for six years or more, Kallner (94) emphasized the fact that deviation of a child from the "channel" on a grid need not imply disorder of health or permanent deviation from normal physique. Developmental deviations which appeared to be pathological in the light of the grid method were not at all rare and might easily lead to diagnostic, prognostic, and therapeutic errors. Kallner preferred to use DeToni's auxometric triangle.

Length of Life

Lancet (102) has pointed out the lack of any substantial progress in the extension of the span of life for the over-sixties as one of the failures

of modern medicine. The elimination of cardiovascular renal disease would, it seems, increase the expectation of life at 60 by 8.88 years; the elimination of cancer would effect an increase of 1.11 years; and the elimination of accidents and infectious disease would increase life expectancy of 0.35 years each.

McCay (116) has summarized experimental work indicating that retarding the rate of growth during the early development of the child tends to increase markedly the life span. The relationship between early development and aging certainly needs to be further studied and studies of younger and older age groups need to be better integrated.

Increasing importance has been attached to the question of tempo of growth after the fourth decade of life (49). It is known that between species the rate of maturation and length of life are closely related. Is that true within the human species as well? Evidence that longevity and the tempo of growth are inversely related is so far indirect. Direct evidence must be furnished by longitudinal studies.

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CHAPTER II

Development of Mental Functions

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THE chief problems and research trends in the study of mental development were defined, as of 1950, in the previous growth and development numbers of the REVIEW (46, 107). Current studies have shown a sustained interest in each of these topics, with special attention to certain critical issues. Renewed effort is being directed toward the analysis of socio-economic factors in relation to intelligence and achievement. Age changes in mental abilities, and responses to the same tasks at different ability levels, have continued to receive marked emphasis.

Some interest in the effect of glutamic acid on intellectual development was reflected in the previous review, and research on this relationship has gained momentum; however, in view of the negative results of the majority of these studies, further inquiry in this particular area may be expected to diminish.

The examination of mental-physical relationships has continued; of particular note in this connection are recent studies on the effect of pre-natal and natal conditions on later mental status. If we are to judge by the number of publications, the relationship of interests to abilities is no longer a prominent topic, but much still remains to be done in analyzing the role of emotional factors in mental functioning, and studies in this area have opened a number of promising leads. Differential fertility is also a topic of concern; the publication of several major reports has raised new problems which require additional study, particularly in relation to social trends in age at marriage and in family size.

Infant Tests

Earlier studies have usually failed to show a significant relation between measures of developmental status in infancy and later mental ability. In the attempt to improve prediction, Escalona (31) used clinical estimates of "optimal level of functioning" in the performance of 72 children on the Cattell Infant Intelligence Scale and the Gesell Developmental Schedules. The assumptions underlying all mental testing imply that defects in cooperation, effort or rapport, or disturbing factors in the environment, will adversely affect reliability and validity. It is not surprising that over short intervals in early childhood, retests showed better agreement of scores when the conditions were favorable to valid measurement. Escalona's results, however, do not promise a technic for effective long-range prediction from infant tests.

From infant tests in the Department of Pediatrics, Yale School of Medicine, Klatskin (60) has noted an apparent tendency for infants currently

tested to make higher scores than were usually obtained 15 or 20 years ago. In a comparison with test norms on the Cattell Infant Intelligence Scale, infants around a year of age showed a significantly higher percent of success on most items, with the constant exception of vocabulary items. The largest percent of passes was on gross motor items. Klatskin suggested that less confining clothes, greater parental attention, and more exercise and stimulation have resulted in general motor advancement. Further evidence is needed, however, to analyze sampling factors.

Abilities at Different Developmental Levels

McKee (66) gave the Primary Mental Abilities tests to a group of superior children approximately five to seven years of age. In all age comparisons there was greater variability among the younger children; this form of the test is probably unsuited for use among seven-year-olds, since superior children approach a ceiling between six and seven. Durling and Benda (26) studied the mental growth curves of Mongoloid patients and found some which reached a peak of development before 16 years, others at later than 20 years.

Two studies of mental defectives have reported on mental scores over a wide age range. Among institutionalized epileptics, Reed (81) found increases in mental ages into the age group 15 to 20. Contrary to reports which have indicated deterioration among epileptics, in these hospital cases no average decline was found between 20 and 45 years. Thompson (94) administered a series of performance tests to mental defectives between the ages of 16 and 69. In comparison with data on normals, decline tends to occur earlier; the significant decline found between age 20 and 30 was attributed to age per se, since it was independent of recency of schooling, degree of motivation, level of attention, or effects of institutional life. Contrary to expectation, performance scores beyond 30 remained approximately constant.

The majority of studies reported in this review utilize results from standardized tests of abilities. In a somewhat different approach, Martin (68) recorded the spontaneous expression of children (age three to seven) when they were given a series of stimuli possessing characteristics of number, size, and pattern. With increasing age the subjects showed greater awareness of size and quantity, and used a larger and more versatile vocabulary to describe their reactions. The ability to discriminate seemed of primary importance, and this ability increased with age. The adoption of a system of terminology, for example, the number system, apparently only facilitated a process already understood on a nonsymbolic level.

Springer (91) studied the development of an understanding of time, and the clock, in four- to six-year-old children who had had no formal instruction in telling time. In outlining the sequence of development with age, she showed that developmental trends are reflected not merely in adequacy and precision of response but also in the nature of the errors.

Feifel (33) analyzed the word definition errors of 900 school children 6 to 14 years of age. A gradual change in the type of error was noted, rather than definite stages. No particular error was made exclusively by any age group. The errors of the older children were similar in type and frequency to those of normal adults.

It is a common belief, not shared by psychologists, that children of low IQ tend to show a compensating superiority in motor activities. Evidence of the fallacy of this belief may be found in the investigations of Sloan (88) with the Oseretsky Tests of Motor Proficiency, and of Cantor and Stacey (15) with the Purdue Pegboard. Crain and Werner (19) studied the development of visuo-motor performance on the marble board, in children from 6 to 12 years old. Figural perception, involving apprehension of part-whole relationships, increased with both CA and MA. As compared with normals, mentally retarded children of the same MA levels were more accurate in final achievement, but displayed less mature modes of visuo-motor procedure and of figural organization.

Another study in a series of investigations of speech development in infants was published by Irwin (51). His evidence indicated that the course of development of initial consonants during infancy is linear; that of medials, decelerating; and that of the finals, accelerating. Initial consonants rarely appeared in speech patterns during the first half-year.

Constancy of IQ, Aptitude and Achievement

The stability of test scores is a topic of enduring interest. For 51 subjects, Brown (12) compared first-grade Stanford-Binet scores with scores on the Army Alpha or the Otis, obtained 12 years later. The mean IQ difference was less than four points. Cane and Heim (14) repeatedly tested small groups of less intelligent and more intelligent adults. They found that test scores tended to increase in all cases, with the initially high scorers showing the greatest improvement. The order of the subjects within their own group was fairly stable, and stability increased toward the end of the experiment. Visually biased questions were easier than verbal or numerical questions for the less intelligent, whereas the more intelligent showed no uniform preference. A differential increase in score upon retesting was also found by Peel (76) among 10- and 11-year-olds, with the greatest increase among subjects whose IQ's were 120-130. In a group of retarded children who had first been tested between the ages of four and one-half and six and one-half, Elwood (29) found no significant change in the mean IQ at later ages (seven and beyond). Similar results were obtained by Engle and Hamlett (30); IQ's based on the Buck Time Appreciation Test showed on the average less than one point change after an interval of three years. Individual cases in which changes of more than 10 points occurred also tended to show changes in the general clinical picture.

Doppelt and Bennett (24) reported on the Differential Aptitude Tests given to the same subjects in Grade IX and Grade XII. In general, abilities were stable over the three-year period. The highest retest correlations were for Verbal Reasoning and Language Usage.

Sex Differences in Intelligence and School Performance

Among 600 college students, Fitt and Rogers (34) found the females to be younger than the males, and superior and less variable on both Form A and Form B of the Cattell Intelligence Tests, Scale III. The sex differences were interpreted as due to the verbal nature of the tests. On a high-grade intelligence test administered by Wallace (101) men's scores were significantly higher than those of women in eight English universities and teachers colleges; at Oxford and Cambridge, presumably due to different sampling factors, sex differences were not significant.

In an institution sample, Johnson (54) tested a group of retarded children on the Raven, Binet, and Arthur tests. Altho the average age of the girls was greater than that of the boys, the boys obtained consistently higher mean scores, with much greater variability. Selective factors operating in referrals to the institution were conceived as influencing these results.

In achievement tests, Grades II to IV, Pauley (75) found girls consistently superior to boys, not only in reading but also in arithmetic, altho the girls averaged two to three months younger than the boys. A study of Negro children in Grade III revealed an even more pronounced sex difference. Pauley urged that the legal school entrance age for boys should be raised at least three months above that for girls.

Differences among Ethnic Groups

Carlson and Henderson (16) have reported IQ differences between a group of 115 American-born children of Mexican parentage and a white, non-Mexican control group living in the same neighborhood and attending the same schools. Children of Mexican parentage consistently tested lower than the controls, the difference between the two groups increasing from the first to last testing, a span of five and one-half years. Mean non-language scores on the California Test of Mental Maturity did not differ markedly from the mean language score for either group. These results are in agreement with some previous studies but are, of course, subject to the usual difficulties of interpretation with regard to the origin of differences between groups which may differ both in genetic selective factors and in cultural background. Pasamanick (74) has commented on the foregoing study, pointing out variables which he considers to have been uncontrolled (cultural-motivational factors, physical factors related to diet, attitudes of examiners, etc.).

Three studies of the performance of white and Negro infants on the

Northwestern Infant Intelligence Test and the Cattell Infant scales have been summarized by Gilliland (38). Negro infants scored significantly higher than whites in one study and higher but not significantly so in two others. The results are in conformity with a number of previous reports in which differences during infancy show a reversal of group differences usually found at later ages. Among Negro children in Grades I to VIII Coppinger and Ammons (18) found a retarded development of vocabulary in comparison with whites: a difference of about two years on the Full Range Vocabulary Test, and of three to five years on the Stanford-Binet vocabulary test. Similar results were obtained for both sexes. On the basis of army tests (AGCT) Fulk and Harrell (35) subdivided over 2000 Negroes and a similar number of whites on the basis of last school grade completed. The mean score of whites exceeded that of Negroes at each grade, but the differences were less at the higher school grades beginning with Grade X. This might be attributed either to greater equivalence of environmental opportunity or to a more intensive selection of Negroes in the upper grades. Performance of both groups was directly related to amount of schooling. Davidson and others (21) used the Wechsler-Bellevue in testing Negro and white psychoneurotic adult patients, matched for age and educational level. The Negro patients scored lower than the whites on the verbal, performance, and full scales, altho on the verbal scale only the arithmetic scores were significantly lower.

Turner and Penfold (97) made a comparison of Indian children of three tribes with white children from surrounding rural districts. Results favored the white children on the Henmon-Nelson and Otis group tests (differences increasing with age) and on the Progressive Matrices Test and the Wechsler Verbal Scale. On the Wechsler Performance Scale, however, the Indian children earned approximately average scores.

It is obvious that the findings reported in this section involve the problem of the comparative appropriateness of different types of test content. Another factor of possible importance is that of bilingualism, which will be discussed in the following section.

Bilingualism

Several recent studies support earlier evidence as to the adverse effect of bilingualism upon obtained IQ. In two elementary schools in New York, Darcy (20) gave both the Verbal Series and the Nonlanguage Series of the Pintner General Ability Test to fifth- and sixth-graders of Puerto Rican parentage who spoke Spanish at home. The mean nonlanguage IQ was significantly higher than the verbal IQ. Two ingenious approaches to the problem of bilingualism have been made by Jones. In one study Jones and Stewart (57) equated a group of 10½- to 11½-year-old bilingual children from rural Welsh-speaking areas with monoglot children from rural English-speaking areas and determined the difference between the two groups on a verbal test after allowance had been made for the

initial difference on a nonverbal test. The difference between the groups was materially reduced but still significantly in favor of the monoglot group. Regression of verbal on nonverbal scores was fundamentally the same in both groups. In another study, Jones (56) gave Welsh-speaking children aged 10 to 12 a nonverbal test with verbal instructions in Welsh, a verbal test constructed in English and two tests of English reading. The mean nonverbal IQ was significantly higher than the verbal IQ, the difference tending to diminish as reading age in English increased.

Environmental Influences on Intelligence and Achievement

The larger part of the studies dealing with environmental influences has been concerned with socio-economic factors in intelligence test performance.

A monograph by Eells and others (27) on the effect of cultural background on test IQ has already stirred a considerable amount of controversy. The monograph includes a review of studies in this area, an analysis of cultural factors which may affect test IQ's, and a report on a field study conducted by Eells. The field study group consisted of children aged 9 to 10 and 13 to 14 from schools in and around Rockford, Illinois. Significant correlations ranging from .20 to .43 were found between test scores and scores on the Index of Status Characteristics. Many item analyses are reported, comparing the responses of two extreme groups, "high status" and "low status" children.

The point of view of the Chicago group concerning cultural factors in test performance is presented in another publication by Davis (22), who points out ways in which the conventional intelligence tests are biased in favor of the upper classes. He gives examples of biased and unbiased items and the difference in percent passing that these items show. It is generally conceded that such psychometric factors are responsible for a part of the socio-economic differences often reported. However, in view of known selective processes in connection with occupational demands and social mobility, some doubt remains as to whether all of the obtained differences between social classes and cultural groups can be explained in terms of test bias.

Current interest in this problem is reflected in a number of other investigations. The socio-economic differential in mental test scores is easily demonstrated as early as two years of age. In infancy, however, reliable tests may indicate either no difference, or higher scores for those of lower status. This has been accounted for both in terms of psychometric factors (early tests less weighted against cultural handicap) and, quite speculatively, in terms of individual differences in growth curves (more rapid earlier growth, especially in functions closely related to phylogenetic traits, among children whose later development has a lower potential). In three different investigations summarized by Gilliland (38) no significant differences in IQ were found when the infants were grouped accord-

ing to mid-parent socio-economic status, or on the basis of educational background of the parents.

Comparing children of upper and lower socio-economic background, Tate (93) found significant differences not merely with the Stanford-Binet but also with two performance scales (Leiter, Arthur).

Thorndike (96) examined a number of community variables as predictors of intelligence and achievement. Measures of the education of the adult population, home ownership, and quality and cost of housing yielded the highest correlations with children's intelligence test scores. Other significant correlations were found between children's IQ's and proportion of native-born whites, rate of female employment, and frequency of professional workers. The importance of these factors differed for rural and urban areas, an urban-rural factor or something associated with it also being important, since the mean IQ's for rural areas were significantly lower than those for urban districts. There was little evidence of relationship between community variables and academic achievement. Thorndike suggested that this might be due to the de-emphasis of traditional subjects in the more advanced communities; the data provided some support for his hypothesis.

Roberts (82) classified a group of Negro college women according to socio-economic status and home location—North or South—and compared their ACE scores and academic achievement over the four-year college period. Differences in ACE scores in favor of the upper socio-economic group were found each year, but were significant only for the southern group. The northern girls were consistently superior to southern girls on the ACE, even when matched for socio-economic status. The relative difference decreased with time, but was still significant at the end of four years. Differences in academic achievement, originally in favor of the North, disappeared by the end of four years. Barrett (4) compared the IQ's of pupils in the two-year and four-year courses in a commercial high school. As might be expected, the students in the two-year course were significantly older and had significantly lower IQ's.

Attitudes toward education, and socio-economic expectation, were examined by Hieronymus (47) among ninth-graders in a midwestern city; low positive correlations were found with both socio-economic status and test IQ. Socio-economic status was more closely related to level of socio-economic expectation than was test intelligence. A study by Phillips (79) involved the correlation of scores on a social questionnaire (based on attitude and behavior characteristics of the various social classes) with scores on the California Personality Test and with IQ on the Otis test. Among ninth- and tenth-graders it was found that pupils with a high score on the lower class social scale tested reliably lower on the Otis and the personality test. Individuals deviating from their allegedly "true" social level scored lower on the personality test and had lower IQ's than "pure" members of a class. Campbell (13) found that underachievers, overachievers, and students progressing as expected, were of about the

same level of intelligence and primary school attainment, but they differed greatly in the social and cultural level of the homes from which they came.

A traditional type of study in the area of nature-nurture is the determination of intelligence and achievement of adopted children. Skodak (87) reported correlations between the IQ's of own-adopted and adopted-adopted pairs of siblings. The mean IQ of the own children was 112; that of the adopted children, 110. The correlation between IQ's of pairs of adopted siblings was .65. The sibling correlation between IQ's of own and adopted children was $.21 \pm .13$. Skodak pointed out that this is based on a very small number of cases and a restricted range of IQ. She concluded, however, that the patterns of mental growth shown on repeated examinations indicated a similarity between pairs of children growing up in the same family.

A follow-up of children placed by various German agencies between 1913 and 1920 has been made by Zur Nieden (108). These children came predominantly from the lower and middle classes, and two-thirds of them were placed in homes of the same social status as that from which they came. The majority of the others were placed in homes of higher social status than those of their origin. The writer reported that only 8 percent of these children had poor school records.

A review by McCandless (64) covers pertinent literature pertaining to environmental influences on intelligence.

Genetic Influences on Intelligence

Researches on genetic influences on intelligence have been less numerous than those on environmental influences. However, interest in the problem of differential fertility rates among the various intelligence levels in the general population has been given impetus by the publication of two long-awaited surveys. Predictions had been made that the low reproduction rate among persons of superior intelligence and the higher rate of reproduction among those of low intelligence would result in about a one point drop in the average IQ over a period of 10 years. Instead, the Scottish survey (95) showed a higher mean IQ for the 11-year-old population tested in 1947 than had been found among 11-year-olds in 1932. In England, Cattell (17) tested 10-year-olds in a typical industrial area and a typical rural area with a nonverbal intelligence test. The scores obtained in 1949 averaged 1.28 points higher than the scores obtained in these same areas in 1936-37. However, he found that above an IQ of 130, there was a decline at about the rate predicted. Further, when the population was divided into halves, the lower half showed an increase of 2.58 points, while the upper half held approximately constant. Among the factors which might account for the increase, Penrose (78) proposed that fertility may be restricted at the lower as well as the upper end of the intelligence distribution, so that the population is replenished from the middle of the distribution. Lorimer (63) has reviewed recent studies

of differential fertility rates and suggested various hypotheses and conclusions to be drawn from them.

Several recent studies have been made on the relation of intelligence and family size among college students. In such special selections various biasing factors may occur; one of these was demonstrated by Shuey and Hedrick (86), who found a small negative relation between intelligence and family size among 2261 students entering a southern women's college between 1939 and 1949. This appeared to be due, however, to subjects with sisters who had attended the college, and who were admitted under possibly less stringent admission standards than other students. Eliminating these cases, the remaining group represented a section of the population within which differential fertility (with regard to intelligence) has practically ceased to operate. Warburton (102) in England and Maxwell (71) in Scotland also found essentially a zero correlation between students' IQ and family size. In a broader sample studied by Vernon (99) scores on six mental tests were utilized for 10,000 18-year-old British army recruits. The negative r between "g" and family size was greater than that between education and family size.

A subject related to the genetic aspects of intelligence is the frequently reported association between month of birth and intelligence; this is now commonly believed to be due to a socio-economic seasonal difference in conceptions. An interesting study by Gordon and Novak (40) presented three analyses of birth month as related to IQ. Data for entering classes, half-grades, etc., are not fully suitable for this purpose due to academic selective factors; when these factors were controlled by taking records for an entire school, the mean IQ for children born in October was found to be significantly higher than for children born in April. This is not in agreement with some previous studies.

Kallmann (58) has summarized and interpreted the present state of knowledge of the genetic aspects of mental deficiency. An analysis of available data on familial Mongolism in relation to maternal age was made by Penrose (77). He suggested a genetic factor, the manifestation of which might depend largely on conditions connected with maternal age. A report taking an opposed point of view was that of Benda (8), who cited three recent monographs all of which emphasize health deficiencies in the mother, rather than genetic factors.

General Treatments of Defective and Gifted Children

Recent literature has been reviewed by Whitney (104), Fairweather (32), and also, in relation to definition and differential diagnosis, by Robinson and Pasewark (83). Other papers dealing with the mental defective were those of Benda, Farrell, and Chipman (9), Doll (23), Guertin (41), and Whitney (105). Jastak (52, 53) and Kanner (59) have been particularly concerned with the role of emotional disturbances in relation to apparent mental retardation; the latter outlined the results of a factor

analysis of personality variables and their relation to learning. The major adjustment problems of mentally retarded children, at different age levels, and problems of training, have been discussed by Hay (43). Adjustment problems have also been described by Walker (100), and Weiner (103) with reference to retarded children in school, homes, and in institutions.

The gifted child has commanded somewhat less attention in the literature. Two principal reports are by Witty (2, 106), who pointed out the need for early identification and guidance of superior children and stressed the importance of the home in fostering talent and in social and emotional growth.

Mental, Physical, and Physiological Interrelationships

As has been true in the past, many of the attempts to assess relationships between mental and physical development have utilized the mentally defective as subjects.

Glasser, Jacobs, and Schain (39) determined the Rh types of 200 mental defectives and their mothers. The percent of Rh-positive children of Rh-negative mothers was not significantly different from that in the general population. This finding is particularly important in view of the claims which have been made regarding the role of Rh incompatibility in producing mental deficiency.

Using normal siblings as controls, Gerver and Day (37) studied the mental abilities of children who had recovered from erythroblastosis. The affected children had significantly lower IQ's than their unaffected siblings. There were low positive correlations between IQ and total amount of blood administered and between IQ and lowest recorded level of hemoglobin. In order to evaluate inferences which have been made concerning the effects of anoxia upon mental development, Usdin and Weil (98) compared children who had been apneic for three or more minutes at birth with a control group who had breathed spontaneously. There was no significant difference in IQ between the two groups.

Boldt (11) studied the records of institutional patients in search of potential cases of postnatal cerebral trauma. He estimated that 1.5 percent of institutional defectives had suffered such trauma. Spinal X-rays of Mongols by Mautner (69) revealed a high incidence of spinal defects. He concluded that his findings agreed with other data supporting a theory that pathologies appearing in Mongols are related to development taking place during the sixth to ninth week of fetal life. In another study Mautner (70) investigated congenital heart disease among the feeble-minded. Igersheimer and Mautner (50) found a type of cataractous opacity developing in the lens of Mongols, chiefly between the ages of 12 and 14. This lens change was similar to changes found in certain endocrine disorders. A study of dentition in mental defectives by Spitzer and Mann (90), indicated that anomalies of the teeth are related to various congenital defects. In Mongols, Dow (25) found an early incidence of the tooth anomaly

known as periodontoclasia and suggested tissue starvation due to a slight anoxia as a possible cause.

The role of hearing defects in mental deficiency has often been discussed. Birch and Matthews (10) tested the hearing of patients in a school for defectives. In comparison with data available for normal groups there was two and one-half to 18 times as much hearing loss among the retarded, depending on the tonal frequency used. The median hearing loss for males was about three times that in the general population; for females it was approximately 10 times that of the normal population. Schunhoff and MacPherson (85) surveyed 60 institutions for the mentally deficient and found a high percent of hearing impairment. They recommended the establishment of classes for the hard-of-hearing in state schools rather than the inclusion of defectives in schools for the deaf.

An operation designed to increase the blood flow to the brain was reported by Beck, McKhann, and Belnap (6) as producing intellectual improvement in children suffering from brain abnormalities due to injury or inflammation. The most striking results were obtained in cases of convulsive disorders.

Blind children at Perkins Institute were tested by Hayes (44) with adaptations of the Binet and Wechsler tests. In comparison with the Stanford-Binet standardization group, there were more blind children at both extremes; on the Wechsler, the weighting was heavier at the upper end of the distribution. Nonequivalence of tests, sampling factors, and effects of special training may have influenced these results.

In a study by Smith (89), deaf children 11 to 16 years of age scored significantly below the standardization means on the Progressive Matrices Test, the Jenkins Scale of Non-Verbal Intelligence, and on reading and arithmetic tests. There was no relation between percent of hearing loss and IQ or between IQ and age of onset of deafness. Younger deaf children, between 4 and 11 years, were not significantly below the population mean, but there was a suggestion of declining score with increasing age.

Bayley (5) investigated the relationship between intelligence and masculine interests (Kuder tests) and masculine physique (somatic physique) among subjects from the Berkeley Guidance and Growth Studies. Generally negative results were obtained. On the hypothesis that critical flicker-fusion is a centrally limited phenomenon, Tanner (92) correlated several measures of critical flicker-fusion with scores of male college students on the ACE. In this preliminary study several significant correlations were obtained.

Hofstaetter (48) presented a theoretical paper relating rate of maturation, among animal species, to the ratio between brain weight and body weight.

Recent studies of the effects of glutamic acid reflect greater care in experimental design and in the use of controls. In well-controlled experiments, Ellson, Fuller, and Urmston (28), Loeb and Tuddenham (62), McCulloch (65), Milliken and Standen (72), and Oldfelt (73) all agreed

in finding no significant improvement on tests of intelligence, personality, or motor ability after the administration of glutamic acid. Harney (42) claimed beneficial effects of glutamic acid on the mental age, personality, and school achievement of retarded girls. No effect on physical growth was observed.

With some conflict in results, two studies reported follow-up investigations on cases which had shown earlier improvement during glutamic acid therapy. Quinn and Durling (80) found that a substantial proportion of their cases retained IQ gains but made no noticeable improvement in social competence. Rudolf (84) stated that about half of his cases continued to improve but in one aspect only. Gains in IQ were slight but improvements in social age and social quotient were regarded as more noticeable. A review by Gadson (36) provides a summary of the work on glutamic acid and mental deficiency.

Intelligence and Personal and Social Adjustment

Lightfoot (61) compared 10- to 13-year-old children classified into two groups, the bright (IQ 130-200) and the dull (IQ 68-104), on a large number of personality variables. The bright children were favored on ratings of achievement, affiliation, autonomy, cognizance, creativity, and dominance; the dull children were favored on ratings of dependence. In comparison to the norms for the Maller Personality Sketches, the bright were somewhat better adjusted than average; the dull, less well-adjusted. There were significant differences between the two groups on 22 of the "Forty Attributes of Personality."

In a study of the fantasy life of mentally defective girls, Beier, Gorlow, and Stacey (7) found that the richness of their TAT protocols compared well with those of normal adolescents. Traditional signs of concreteness and perseveration were noted. The girls tended to produce rich and sensitive stories with weak, superficial outcomes. Projections seemed to be less distorted than those of normals, as if social learning had not provided the defective with techniques for dissembling. Albee and Pascal (1) observed competitive behavior in mentally defective boys. The dominance order was significantly correlated with MA, as was popularity of individuals. In general, brighter members of the group tended to seek each other's company and were looked to as models. There was no significant relationship between dominance and popularity or between dominance and physical strength, height, weight, or CA. Contrary to expectations based on normal boys, physical strength had little relationship to either dominance or popularity. Among mentally deficient girls, Hays (45) also found that there was a hierarchy of acceptance, showing a fairly high relationship to mental level. The choice of friends was more closely related to MA than to IQ or CA. However, there were suggestions that acceptance was also based upon race, clinical type, and length of residence in the institution. Hollinshead (49) found no difference in social maturity, as

measured by the Vineland Scale, among retarded adolescents who were classified as only child, youngest, oldest, or middle child.

Mangus (67) studied retarded children who were in a Grade III to VI population of over 1200 cases. The majority were dull, normal and borderline; 43 percent had IQ's of 90 or above, and 3 to 4 percent were below 70. Teachers' ratings of these children indicated a tendency toward personality problems, and personality tests similarly showed indications of poor social and emotional adjustment. A study of the social position of retarded children in schools which had no special classes revealed, according to Johnson (55), that their mean social quotient was significantly lower than that of the other children. Acceptance scores increased steadily with IQ, while rejection scores decreased. The percent of "stars" increased with IQ; the percent of isolation decreased. Retarded children were seldom rejected because of poor academic ability. Instead, the reason given most often for their rejection was unacceptable behavior. A comparison which controlled the factors of socio-economic status, and of being overage for grade, indicated that social position in the school was less influenced by these factors than by intelligence.

Ausubel (3) investigated prestige motivation among gifted children in Grade VI. Children with IQ's of 130 or more were divided into two groups, the highest prestige children and the lowest prestige children. The difference between scores made under anonymous unspeeded conditions and under conditions emphasizing competitive status and prestige was significantly greater for the high prestige group. It was also found that high prestige children more often expressed enjoyment of the competitive situation, and worked faster under prestige motivation conditions. Differences which were suggestive but not significant included greater liking for arithmetic by the high prestige group and more frequent self-imposition of competition during anonymous tests by the high prestige group. The upper group was rated higher on scholastic competitiveness by themselves, their parents and their teachers.

Many of the studies reported above involve only minor contributions. Altho of cumulative value, they lack the scope and impact of major research. It is to be hoped that future investigators will be able to make more systematic use of statistical technics which are now available but which are often ignored or used poorly—factor analysis, where this is appropriate, and analysis of variance, both for separating the influences of different variables and for assessing interactions between variables. We may also hope that more extended use will be made of longitudinal studies, particularly of twins and of children from contrasting environments.

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CHAPTER III

Aging and Psychological Adjustment

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THE term "psychological adjustment" refers to the processes by which an individual seeks to secure satisfaction of his wants and needs. The processes available to the individual as well as the methods followed undoubtedly change with age, since desires, needs, and goals are different at different ages. In addition, changes in structure and functional capacities of the individual which take place with advancing age may limit the methods available to him in securing satisfactions for these changing goals. On the other hand, life experiences may offer a widening range of adjustment technics to the individual. Of equal importance are the restrictions and limitations imposed by the cultural pattern in which the person lives. In our own society, the adjustment of older persons is rendered particularly difficult because we have not yet developed any universally sanctioned pattern of activities for the transition from middle age to old age. In primitive societies, the role of the "elder" was specifically defined (76).

In the United States the aged, in spite of a few conspicuous exceptions, are no longer held in the position of respect characteristically occupied by the aged in past society. Furthermore, our society, while setting up specific requirements for retirement, has not yet defined any specific functions for individuals after retirement.

Altho a strictly scientific approach to the problem of adjustment would simply describe the behavior patterns followed by individuals in securing satisfaction for their wants and needs, most research has been centered about describing differences between "good" and "poor" adjustment. Thus a value judgment has been introduced by most investigators. In general, the "well-adjusted" person is said to be "the person who is able to satisfy his needs quickly and adequately within the controls and outlets provided by his culture" (17). It should be emphasized that any attempt to rank individuals with respect to adjustment on the basis of this definition involves a multi-dimensional problem: estimates of relative degrees of satisfaction of individuals, speed of attaining these satisfactions, and estimates of the acceptances of the methods used within the framework of the social structure must all be made. When we add the component of change in social patterns with time, the problem of measurement becomes vexing, to say the least.

This review will concern itself with (a) the role of individual orientation with respect to needs and goals, (b) the role of age changes in the individual which may limit or extend the processes available for attaining desired goals, and (c) the role of limitations imposed on individuals by the social and cultural environment. Only illustrative studies can be men-

tioned in the space available. In the past, most studies have been directed toward the second question. Very little research is available on the third question.

The Role of Individual Orientation

Age Changes in Needs and Goals

Even casual observation leads to the presumption that needs and goals change with age. Studies in the field of child development have shown how the incipient cowboy of five becomes the potential engineer at 15 and finally ends up as the bond salesman at 35. However, little is known of what changes in goals the bond salesman may undergo as he becomes 60 or 70 years of age. Clinical studies by psychologists and psychiatrists have indicated the futility of attempting to obtain information on the true motivation and goals of individuals by direct questionnaires or interviews. Much more subtle devices must be utilized. It is to this end that many of the so-called "projective" technics have been developed. Altho the aims of these technics are most worthy, it must be admitted that up to the present most of them lack the kind of specificity and degree of standardization that psychologists have come to demand in problems of measurement.

Some of these methods, such as the Rorschach, have been applied to older subjects. For example, Klopfer (48) administered individual Rorschach tests to 50 subjects between the ages of 62 and 93 years. The author interpreted his results more in terms of a subject's response to the environment than in terms of changes in fundamental goals or needs. He believed the test results indicated "loosening of intellectual ties to reality, inability to make full use of inner resources, difficulty in forming social relationships, and reduction in responsiveness to fine emotional nuances in the environment" among the aged subjects. The vagueness of these statements emphasizes the need for a sharpening of concepts and methodology in the field of projective tests if they are to prove of value in establishing specific age differences (87).

A more direct approach to the question of age changes in goals has been made by Kuhlen and Johnson (50). Responses to the question "What would you most like to be doing 10 years from now?" were secured from a 39 percent return of high-school and elementary-school teachers between the ages of 20 and 64 years. The responses were analyzed separately for 467 single women, 280 married women, and 218 married men. In all groups, interest in retirement within the next 10 years began to occur in the forties. This response may reflect an acceptance of the cultural requirement to retire at age 60 or 65 rather than the desires of the individual. Hope to marry, expressed by the majority of single women in their twenties, was mentioned by very few after age 30, at which age the

desire for vocational advancement was stated with increasing frequency. Young married women teachers in their twenties indicated a desire to be in their own homes, and vocational goals were more secondary than in the case of the single women. Married men were primarily interested in vocational advancement. After age 40, those desiring to change their vocation diminished rapidly to 0 percent at age 55.

Age Changes in Interests

The expressed interests of individuals may be of value in the assessment of their goals. An extensive body of information regarding interests has been derived from studies utilizing the Strong Vocational Interest Inventory (82). Altho originally devised to differentiate between interests of people successful in different occupations, investigations over the years have yielded data pertinent to age. Comparison of interests of 472 15-year-olds, 215 25-year-olds, 275 35-year-olds, 213 45-year-olds, and 151 55-year-olds led to the observation that the 400 items of the inventory could be classified into four major categories: (a) items showing consistent age differences in all occupational groups from age 15 to 55, (b) items exhibiting age differences common to all occupational groups but with an alteration in the direction of change at age 25, (c) items whose age trend varied between occupational groups, and (d) items which changed very little with age in any group (84). Examination of the items showing definite age differences reveals certain natural clusters, but the reasons for the differences are difficult to identify. The decrease with age for liking "aviator," "secret service man," and "ship's officer" may be regarded as specific instances of growing dislike for hazardous occupation. There was also a trend in increasing like for more sedentary activities among the older group. In general, Strong has found that vocational interest scores change greatly between the ages of 15 and 25 but that between the ages of 25 and 45 the general population earns for each of the 34 scorable occupations almost uniform average scores from decade to decade. However, some occupational groups, such as aviators, showed lower scores on scales for their own occupation in successive decades.

Strong (83) has also retested several groups of men after intervals of 1 to 22 years. In a group of 228 men who were first tested as Stanford University seniors in 1927 (mean age 22), the median intercorrelation between scores made at this time and retest scores obtained 22 years later was 0.75. This indicates a rather remarkable reliability of scores designed to indicate interests over a period of two decades.

Age Differences in Masculinity and Femininity of Interests

With increasing age the differences between interests of males and females diminish. Terman and Miles (86) devised a questionnaire consisting of items which in preliminary studies indicated different distri-

bution of responses by men and women. Responses were obtained from 1047 men and 1912 women between the ages of 20 and 89 years. A decline in masculinity of interests or increase in femininity of interests for both men and women after the age of 20 was found. The decline in masculinity of interest scores was much greater for men than femininity was for women. The decrease in masculinity of interests of men was greater than the reduction in femininity of interests of females at the high age levels. These results indicate that the activities, opinions, likes, and dislikes which distinguish men and women are to a large extent the same as those which distinguish younger men from older men. For example, women are less inclined to participate in sports than are men, and older men are less inclined to engage in these activities than are younger men. Rather than describing older men as more feminine than younger, it is equally correct to describe women of all ages as more mature than men, since their interests resemble those of older men more closely than they resemble those of younger men.

Scores for masculinity and femininity of interests may also be derived from the Strong Vocational Interest Inventory. Such scores show a tendency toward an increase in femininity of scores with advancing age, altho the trend is less pronounced than in the data reported by Terman and Miles. Altho the differences in results may be due to differences in the sampling of subjects, it is equally likely that they are due to differences in the selection of test items. Strong selected items which differentiated between occupational groups, whereas Terman and Miles selected items which differentiated between males and females. This emphasizes the need to select test items which are representative as well as to select representative subjects.

Age Changes in Reading Interests

Unfortunately the numerous studies of the amount and kind of reading done by various groups (42) do not lend themselves to an identification of age differences since the selection of subjects has not been broad enough to justify generalizations. A summary of public opinion polls (16) gives some information about specific types of reading matter such as newspapers. The studies summarized were conducted in Belgium and Sweden and indicated a slight increase in reading of newspapers among elderly people. More pertinent is the study of Campbell and Metzner (15), who conducted a survey of library usage in a national sample of libraries in the United States. One of the questions analyzed for age differences concerned the number of books read during the preceding year. The percent of individuals reading 10 or more books per year was greatest among the 21-to-29-year-olds and fell off sharply with advancing age. It is doubtful whether this finding represents a change in reading habits, since the persons over 60 years of age must have had less exposure to formal education and less access to library facilities in their youth

and middle age. The fact remains, however, that elderly people at the present time do not utilize their time in reading. This fact is recognized by many librarians, and positive steps to expand adult education to include the older age groups have been proposed (25).

Age Changes in Attitudes

Attitude Scales. Since it has been over 20 years since Thurstone first introduced the concept and methodology for the quantitative scaling of attitude items, one might expect the accumulation of an appreciable body of information on age differences in specific attitudes. Unfortunately, this is not the case. By far the greater number of studies still depend on the interpretation of data obtained from unscaled questionnaires or from interviews. Studies utilizing attitude scales are illustrated by Lorge (55) and Marple (56). Lorge compared scores obtained two weeks apart on a number of Thurstone's attitude scales and found higher correlations between the two sets of scores in subjects over 40 years of age than in subjects 20 to 25 years of age. The investigator concluded that there was greater stability of social attitudes in the older subjects than in the younger. The results also support the theory that a generalized attitude matrix has been adopted by the older subjects as a frame of reference for social attitude judgments. Altho the average scores obtained by the older subjects tend generally in the direction of greater conservatism, the standard deviations are so large that the differences lack statistical significance. No analysis of the age differences in mean scores was made.

Resistance to Change. Marple (56) attempted to alter the expressed opinions of three different age groups by informing the subjects of majority opinion and also of expert opinion on the same topics prior to a second testing. Altho there was a greater shift in expressed opinion (in the direction of greater agreement with majority opinion) among the high-school pupils than among college students and adults (mean age 39.1 years), one cannot assert that the adults were more resistant to change because of their age since the high-school pupils may live in a social climate which fosters the uncritical acceptance of statements of authority.

Conservatism. A comparison of the attitudes and values of two generations (college students and their parents) was made by Fisher (31) using data from standard questionnaires. She concluded that in the parents, conservative and orthodox attitudes were stronger than the more radical and critical ones, whereas the reverse was true among the college students. A number of investigators using various questionnaire and interview technics have attempted to demonstrate a correlation between age and conservative attitudes without success (73).

Pollak (65) analyzed the responses to questions asked in market research programs using population samples which varied in size from 200 to 4600 subjects. The questions dealt with acceptance or rejection of new commercial products, innovations in packaging, and changes in economic,

social, or political organization as well as governmental policies. In none of the material could a clear dichotomy between conservatism of the old and progressivism of the young be demonstrated. Where there was a conservative majority among the old, there was a conservative majority among the young.

Cantril and Strunk (16) have assembled the results of national polls taken in many countries between 1935 and 1946. In some of the surveys reported, responses have been tabulated according to age groups (usually into groups 20 to 29, 30 to 49 and 50 years and over). Among the many questions asked, it is possible to isolate a number in which the proportion of "yes" responses diminishes with increasing age. Examination of these items might lead to the conclusion that old subjects are more conservative than young. This conclusion is not warranted, since among a large number of test items, significant differences in responses of any two groups will occur by chance. Furthermore, many of the questions in which age differences in response occur cannot be unequivocally classified as conservative or liberal.

Thus objective evidence of greater conservatism among older subjects is not available. The need for carefully designed and controlled studies in this important field is evident. Of even greater social importance is the need to examine critically the effectiveness of various technics for altering the attitudes of both young and old.

Age Changes in Estimates of Happiness and Sources of Anxiety

Some indication of the spread between goals and aspirations and their realization may be gained from ratings of happiness and feelings of anxiety or worry. Unfortunately, most of the information on happiness is based on retrospective reports. For example, Kuhlen (49) asked each subject in an interview to draw on a chart a line representing his level of happiness at various ages in his life. In a group of 300 adults ranging in age from 20 to 80 years, happiness ratings tended to increase in the twenties and thirties and to decrease thereafter. Major causes for happiness were related to romance, marriage, family, and occupation. Bereavement, poor health, and occupational difficulties were major sources of unhappiness. The pitfalls in interpreting subjective responses based on retrospective reports are obvious.

Tuckman and Lorge (91) asked 128 graduate students (age 21 to 51, mean 31.2 ± 7.1 years) enrolled in a course on the psychology of the adult to place in rank order the ages in life at which they believed people were most happy. Eight age periods ranging from "up to 12 years" to "70 years and over" were arranged in rank order with respect to a total of 21 traits such as happiness, freedom from worry, health, living a full life, job satisfaction, and ability to learn. Early childhood was considered the most favorable period for "happiness" and "freedom from worry";

adolescence was considered the peak period for "taking part in active sports," and "ability to learn"; the twenties were ranked highest for "health," "ambition," "friends," "freedom," and "in the seeing of things"; the thirties were ranked highest for "activity in family affairs," "needed by others," "meaningfulness of life," and "living a full life"; the forties for "job satisfaction," "salary," "interest in politics," "clubs and organizations," and "financial security"; the fifties for "authority and prestige"; the sixties for "hobbies"; and the seventies and over for "religion."

The attitudes expressed by these subjects may reflect the cultural stereotype that aging is always accompanied by physical and mental decline. There is great need for a continuing educational program to change the negative attitudes toward aging and to develop concepts of a productive, happy, and meaningful later maturity and old age.

It is important to note that only 3 percent of the aged people interviewed by Gardner (38) reported present unhappiness. Altho happiness is undoubtedly a characteristic of psychological importance, it is a multidimensional quality that requires a more precise definition than can be obtained in a gross over-all rating approach. Estimates of happiness should be made in terms of the present situation by young and old for useful comparison.

Age changes in the source of anxiety and worry have been reported by Kerr, Newman, and Sadewic (47). A questionnaire listing 12 potential fields of worry was mailed to 250 American psychologists born prior to 1903. Responses were received from 103 between the ages of 46 and 81 years. Personal appearance and sexual morality were reported as major sources of worry in the twenties by approximately 50 percent of the respondents, whereas 91 percent of the group reported economic and financial worry most prevalent in their early thirties. In the forties the abandonment of hopes or ambition and marital difficulties were the most frequent sources of anxiety. Thus, among this special, but definable population, there is some evidence that the sources of anxiety shift with age. In older subjects, the problem of health and income maintenance become important sources of anxiety (18).

Lifetime worry patterns are also influenced by socio-economic status. Dykman, Heimann, and Kerr (26) compared the worry patterns of 101 successful business men and 100 denizens of Chicago's "Skid Row" with results previously reported on 100 psychologists (47). Ages ranged from 43 to 91 years in the business men and from 44 to 77 in the casualty group ("Skid Row"). The data were obtained by direct-contact anonymous ballot interviews. Contrary to expectations, the casualty group showed a concentration of worries over economic problems in their thirties which extended over a greater age span than did similar worries reported by the business men. Whereas both psychologists and "Skid Row" cases reported a greater incidence of worries than did businessmen, psychologists tended to resolve their worries in a shorter span of years than did the other groups.

Adjustment Inventories

The most widely used device for evaluating attitudes and activities of older people is the inventory, "Your Attitudes and Activities," prepared by Burgess, Cavan, and Havighurst (14). This inventory consists of a series of 110 statements, some of which are checked, some of which are answered by "yes" or "no," while others have a four to seven point intensity distribution. The items are arranged in categories covering health, family, friends, leisure and recreation, clubs and organizations, employment history, financial security, early life, and attitudes. Arbitrary scores are assigned each response on the basis of comparisons of responses of other groups of older individuals judged by interviewers to be well adjusted or poorly adjusted. The correlations between ratings of adjustment made by two to five judges and scores on the schedule range from 0.53 to 0.78. Thus, the schedule is more than a device for the description of attitudes and activities—it attempts to classify individuals on the basis of a value judgment made by the investigators.

Cavan and others (18) have analyzed in detail the responses of 499 men and 759 women (aged 60 to 99 years) to items in the inventory, "Your Attitudes and Activities." Responses were obtained thru staff interviews, interviews by sociology students from a number of colleges, and by mailing schedules to the older alumni of one college and one university. The sample of subjects was drawn from the entire United States but differed from the general characteristics of the population, over 60 years of age, in that the study group contained: (a) fewer persons in the sixties and more in the seventies and early eighties, (b) fewer foreign born, (c) fewer farm residents, (d) fewer subjects residing in small villages, (e) subjects with three to five years more formal education, and (f) more representatives of business and the professions than the general population. In this group, the median score on the attitude inventory declined progressively with age. Calculation of scores on subgroups of items on the schedule indicated that increased age is associated with the following: (a) a decrease in the number of close companions; (b) a decrease in social participation; (c) increased feeling of economic security in spite of lowered amount of income; (d) increase in physical handicaps, illness, and nervousness and a decrease in feeling of satisfaction with health; (e) increase in religious activities and dependence on religion; and (f) decrease in feelings of happiness, usefulness, zest, and decrease in general interest in life. Women reported more physical handicaps, more illness, and more dissatisfaction with their health than did men in spite of the statistical fact that, on the average, women live two years longer than men. Women reported more religious activity and more favorable attitudes toward religion than men but were less happy than men.

Granick (40) has compared the adjustment of older people from two samples of retired people living in two different communities in Florida. Altho one community was of definitely higher economic status than the

other, the similarities in psychological problems were far greater than the differences. Altho the one group lived more comfortably and had more money to spend, their health, family status, attitudes, and ways of spending their time did not differ significantly. At lower levels of income, significant differences in adjustment appeared. Thus, Shanas (71) found poorer adjustment scores among recipients of old age assistance in Chicago than among other population groups such as YMCA secretaries (12) or school teachers whose adjustment was rated by the same instrument (18).

Interviews and questionnaires indicate that the activities of elderly adults are primarily sedentary such as visiting, reading, listening to the radio. Fried (36) found that inactivity in elderly people was much more frequent among low income groups than among those with moderate or high income. The elderly people interviewed complained of inactivity and indicated their preference for doing something. The desire for continued activity has important social implications and indicates the need for re-education both of individuals and the community with respect to attitudes toward aged people. It is also apparent that our educational system has failed to develop in individuals inner resources for continued expansions of interests and activities thruout life. This represents a major challenge to our educational system today.

The Role of Performance Capacities and Abilities

Age Changes in Perception

The maintenance of satisfactory adjustment to the social environment is obviously dependent on perception and communication. The sense organs of vision and hearing represent an essential link in the chain of events leading to communication. Hence, data on age differences in perception are of considerable importance.

Age Changes in Hearing. Altho the incidence in deafness increases with age (from 1 percent at age 20 to 5.9 percent at age 65) (3, 79, 95, 99), the pattern of hearing impairment present in adults is of greater importance. For pure tones of frequencies up to and including 512 cycles per second the total impairment with aging is slight (13, 20). In contrast, there is a marked loss in the perception of tones of frequencies 1760, 3520, and 7040 cycles per second with increasing age. Two independent studies, one on a large sample of subjects tested at the World's Fair in Chicago (79), and the other on 3700 subjects tested at the San Diego County Fair (95), are in essential agreement. Whereas less than 1 percent of the 10-to-19-year-old group showed a hearing loss greater than 45 decibels for a tone of 3520 cycles per second (the higher components of speech), 45.0 percent of the males and 13.6 percent of the females aged 60 and above showed a loss of this degree (95). The greater incidence of hearing loss in males than in females was observed at all age levels. The impairment in perception of higher tones in people over 50 is of psychological

significance since the perception of higher frequencies plays an important role in the understanding of conversation, particularly when several people are speaking at the same time. The ability to understand speech cannot be determined from the audiogram alone. Both the Psycho-Acoustic Laboratories at Harvard University and the Bell Telephone Laboratories have developed standardized speech comprehension tests (22). Altho it is now possible to measure the hearing loss for speech in two syllable words, these tests have not been applied on an age-wide basis. For an appraisal of the understanding of speech, the percentage of carefully selected words which the subject understands as they are spoken in increasing intensity has also been utilized (23) but no data are available in terms of age. In everyday life it is usually necessary to distinguish particular sounds in a background of noise of variable intensity. Hence, tests of masking and discrimination should be applied to older persons in assessing the social adequacy of their hearing.

The degree to which hearing defects may be compensated by adequate hearing aids has an important bearing on the psychological adjustment of older people. According to Silverman and Taylor (75), the value of hearing aids for the aged is questionable. This conclusion is based on the presumption that much of the loss in perception of high frequencies is the result of structural changes in the ear and the auditory nerve and that older persons have less patience and learn less readily than younger ones. While it is true that marked high tone hearing loss is characterized by structural changes, attempts to relate moderate degrees of hearing loss with structural changes have not been successful (75). Hence, it appears that the major obstacles in the correction of hearing impairments are psychological in nature, that is, adequate motivation and training in the use of the device.

Age Changes in Vision. The requirements of daily living depend not only on visual acuity but also on the speed of perception and the comprehension of complex patterns. There is universal agreement that visual acuity diminishes with age (19, 21, 70). Part of this diminution, which becomes more marked after age 40 (19), may be attributed to structural changes in the eye such as increased rigidity of the lens, degenerative changes in the retina (37), and in part to a gradual reduction in pupillary size (9). Bernstein (5) found that the change in refraction of the human eye with age followed a logarithmic function. Furthermore, beyond the age of 20, the sensitivity of the eye under conditions of reduced illumination diminished progressively ($r = .50$) even when pupil size was held constant (7, 29, 67).

The question of age changes in color vision is an open one. Tiffin (89) and later Tiffin and Kuhn (90) concluded that after age 45 both sexes show a loss in color vision, but their evidence is not convincing. Other studies have failed to find evidence of deterioration in color discrimination between the ages of 20 and 60 (11, 19, 78), altho Smith (78) observed a definite drop in ability to discriminate colors beyond the age of 60.

The apparent discontinuity in age changes in color discrimination should be investigated by repeated measurements on the same subjects as they progress from age 55 to at least 65.

A reduction in the speed of visual perception has been demonstrated in individuals between the ages of 20 and 45. Weston (97, 98) retested the same group of experienced observers after a five-year interval and found a significant decrement in all cases. The task consisted in the identification of the gap in a series of Landolt rings. The decrement was greater in the older subjects than the younger and was more apparent at lower levels of illumination (0.5 lumens per square foot) than at higher (500 lumens per square foot). Other complex visual tasks, such as the perception of incomplete pictures, require more time in older subjects (35 to 36 years) than in college students (94). Somewhat related to speed factors in vision is the critical flicker fusion frequency, which fell from an average of 44 to 32 cycles per second in males between the age of 12 to 16 and 77 to 80 years. The correlation of critical flicker-fusion with age was -0.52 (60). Interpretation of these results is difficult partly because we do not know how much of the fusion process (whereby an intermittent light stimulus is perceived as a steady light) is peripheral and how much is central and partly because of technical problems in methodology and experimental design. The results may be taken as evidence of slowing of perceptual processes in the aged.

It is obvious that many of the perceptual deficiencies of the aged may be minimized by the use of proper lenses. Unlike hearing aids, the wearing of glasses has come to be accepted as part of our cultural pattern. Although the impairments of vision related to speed of response cannot be minimized by these devices, the observation that older people benefit markedly from increased levels of illumination (29, 98) offers a potential solution. It is also possible that special training could do much for older persons. No specific experiments on the effects of training in older subjects have been reported, although it is an approach that should be investigated.

Age Changes in Strength and Motor Skills

Quantitative measurements of the strength of various muscle groups have shown a maximum at age 25 to 30 years followed by a gradual decrement up to age 60, followed by a more rapid drop to age 80 (1, 30, 70). It is also clear that the ability to do fatiguing muscular work diminishes with age (77). Since in our present cultural pattern there are few instances where sheer muscular strength is an important factor in performance, this decrement in capacity is of little significance in the adjustment of older people. Of greater significance is the gradual impairment of fine motor coordination (96) and the gradual slowing of the speed of motor responses which begins at 30 to 35 years of age and continues throughout the life span (57, 58, 59). The speed of simple and choice reaction time to both sound and light stimuli diminishes signifi-

cantly with age (4, 32, 39). The speed of well-practiced motor responses, such as handwriting, also diminishes with increasing age (8). The physiological or psychological basis for the gradual diminution in speed of response has not been determined, altho Welford and his associates (96) have developed the concept that changes in skill with age result from changes in the central receptive or perceptual processes rather than from central motor processes or peripheral elements. This hypothesis, altho attractive, requires further experimentation since it has been shown that the speed of conduction of the nerve impulse diminishes significantly after the age of 40 (62). However, the reduction in speed of conduction is not great enough to account for the lengthening of reaction time and diminished speed of other motor responses that are well established. Unfortunately, it has not been possible to design an experiment which will estimate speed of transmission across a nerve synapse in the human.

The reduced speed of response that is apparent in most elderly people has important implications for behavior in a society that places major emphasis on speed and vigor. However, the observed reduction in strength or speed with advancing age should not be regarded as inevitable. The need for research on the possibility of retaining psychomotor proficiency thru special practice or by other means is clearly indicated. In addition, research is needed to determine whether modifications and improvement in the design of equipment and changes in working conditions could not compensate for minor losses in psychomotor abilities.

Age Changes in Disease Incidence

The presence or absence of disabling chronic disease has an influence on behavior and psychological adjustment. A great deal has been written about the increase in physical disabilities in old age. Space does not permit inclusion of this literature, which has been summarized by Stieglitz (80) and Monroe (61). The preoccupation of medical literature with the increased incidence of heart disease, cancer, arthritis, and mental disease must not blind us to certain facts. First of all, most of the information about the incidence of disease and disability is based on the National Health Survey conducted by the United States Public Health Service in 1935-36 (63, 92). In this survey 739,893 families (2,642,809 persons) in 83 cities and 23 rural areas of 19 states were interviewed and tested. On the basis of this study it was estimated that some 23 million persons in the United States were handicapped to some extent by disease, or accidents, and that the incidence of disability increased markedly among the older age groups. It must be remembered that evidence of disability was based on the verbal report of one member of a household and not on physical diagnosis. Furthermore, most of those reporting disabilities were able to work and were living in the community. In fact, more recent studies of older people have indicated that altho 60 percent of those aged 75 to 84 years reported some impairment, less than 10 percent are actually

disabled (74). Sheldon (72) found that approximately two thirds of women over 60 and men over 65 were physically "normal." Among older people living on old age assistance, only 2.5 percent were confined to bed, 8.5 percent were confined to their houses, and 22.5 percent were capable of limited movement in their district. All studies of disease incidence suffer from grave sampling problems. However, it is clear that the reaction of an individual to his disability is the problem of major importance. Many individuals, some suffering from major complaints, learn to "live with their disease" and continue to lead useful and productive lives, while others succumb to even lesser degrees of disability and become chronic invalids (81). The important problem for research is to identify the factors responsible for these differences in response. The studies of Ruesch and his associates (69) have made a beginning. Their results indicate the importance of the social environment in the determination of chronic invalidism.

The increasing admissions to mental hospitals among older people (44, 51) are often cited as evidence of final breakdown of psychological adjustment. It must be remembered that admission to a mental hospital depends not only on the existence of mental disease, but also upon the attitude of the patient and the patient's family and community toward institutionalization and upon the ability of the family to care for the patient in the home. With the trend toward urbanization, opportunities for home care have diminished. Hence, we must interpret hospital admission figures with caution.

With increasing age there is increased incidence of disease and impairment. However, studies on the methods of teaching adults to live peaceably with their limitations are still to be done.

Age Changes in Intelligence

A number of reviews have dealt systematically with intellectual changes during maturity and old age (41, 52, 54, 58, 59, 73). Average test scores begin to decline in the twenties and continue to do so at an increasing rate up to age 60. The extent and nature of the decline in test performance beyond the age of 60 is still uncertain, since adequate samples of adults in this age range have not been systematically tested. Changes with age vary considerably among different kinds of test material. For instance, the decrement with age is very small on vocabulary, information, and similarity test items whereas there is a significant decline in performance on numerical computation, opposites, series completion, picture arrangement, and analogies problems (35). Eysenck (27, 28) concluded that the most rapid decline was in tests which measure the ability to deduce relationships. Tests which require the subject to break away from old familiar mental habits and to adapt to unfamiliar situations yield lower scores in old subjects than in young (33, 34, 43, 66).

However, the diminished intelligence test scores observed in old sub-

jects should not lead us to the glib conclusion that all of the changes are due to age alone. Lorge (53) has shown that when allowances are made for perceptual and speed factors, the decrement in performance among the aged is very small. Unfamiliarity with test material and the testing situation may also play an important role in the lower performance scores. Defects in vision and hearing often limit the use of currently available nonverbal test material with elderly people. Furthermore, many tests in current use do not have sufficient material at low levels of difficulty or do not have high enough ceilings to test superior adult abilities.

Another major difficulty in interpreting age changes in test scores is that the same test items may not be sampling the same mental abilities at different ages. Thus, factors isolated from the intercorrelations of scores on subtests from the Wechsler-Bellevue Scales by the Thurstone contrived method with rotation of ages, gave somewhat different factor groupings among six different age categories (age 9 to 60 years) (2). In the 9- and 12-year-olds a general factor concerned with verbal ability and a factor concerned with ability to recognize relationships were fairly clear. However, with increasing age (25 to 29 years and 35 to 44 years), the factors became more difficult to identify. In the 50-to-59-year group, the average intercorrelations between subtests increased, and there was some evidence that the factors isolated were more homogeneous than in the middle-aged group.

Birren (6) has also subjected data obtained from administration of the Wechsler-Bellevue test to 99 subjects aged 60 to 74 years to a factor analysis. He too found high intercorrelations between subtests but after rotation to simple structure was able to identify four factors: V—verbal comprehension, C—closure, M—rote memory and I—induction. Further analysis of the correlation matrix (rotation of V to an oblique position) led to the conclusion that there was a large second-order factor consisting of stored information which is correlated with both V and C. Since the Wechsler-Bellevue does not include tests of many of the known primary mental abilities, it is of limited value in describing age changes. For this purpose many new tests, particularly nonverbal, need to be adapted and applied to aged persons.

Altho average values may show a decline in mental test performance with advancing age, two important findings must be stressed. The first is the wide range of individual differences in the performance decrement with age. Some individuals in their sixties may perform as well as the average of individuals 20 or 25 years their juniors. The second is the negative relationship between performance level and age decrement. Several studies have indicated that the age decrement is most marked in the subjects showing lower performance ability. The most able 5 percent of the population in a given test performance fail to show any significant age decrement. Altho it is true that the average performance of young university professors was better than that of old, Sward (85) was unable to find clear-cut signs of psychological decline among the bright and

successful senescent subjects. The question of whether or not superior adults suffer a significant decline in performance with increasing age is of considerable social importance and should be intensively investigated. It is necessary to make repeated tests on the same subjects over a period of years if we are to answer the important questions about age changes in intellectual capacities.

Age Changes in Learning and Memory

Since the attainment of satisfactory personal adjustment for older people must often involve the learning of new responses or learning to live within diminishing physical and perceptual capacities, it is important to know whether learning ability is altered. Since most psychologists have assumed that the methods of learning in adults do not differ significantly from those of young people, little fundamental work has been done in this field. A most significant contribution is that of Welford and his associates (96), who offer evidence that the methods utilized by adults are not the same as those of young people. Earlier studies, previously summarized (73), emphasize the importance of types of material used in testing learning ability. It is generally assumed that difficulties in learning encountered in adults are a function of the amount of reorganization of pre-existing habit patterns that is required. This is an attractive hypothesis but one which needs further experimental verification. Whatever the defects of older people may be, there is no evidence for the assumption that they can no longer learn. In view of the social and economic importance of retraining programs for middle-aged and elderly people for their utilization in employment, it is surprising that so little experimental work on defining optimum conditions for learning has been done.

The Role of the Social and Cultural Environment

The adjustive mechanisms available to the individual to secure satisfaction of his needs and goals are limited by the social and cultural environment in which he lives. Thus, in a rural environment, grandpa can sit on the porch and project the results of his tobacco chewing over the porch rail with impunity. The same behavior would scarcely be countenanced from a second-story apartment in the city. Our social pattern demands institutional care for extreme deviations in behavior. As previously stated, our present cultural attitudes toward the aged are ambivalent—on the one hand we reject the elderly by programs of forced retirement, and on the other we are solicitous in attempting to provide economic security for the years beyond age 65.

Altho growth may stop in the physical sense, development should continue thruout life. This concept has not yet gained general recognition or acceptance within our society. Nevertheless, it is one of the important goals of adult education. The role of adult education in altering the cul-

tural pattern and particularly the technics and methods employed in adult education has been considered in the June 1950 issue of the REVIEW. Education is the hope for the future solution of many of the problems of the aged.

The general philosophy of adult education defined as "any purposeful effort, not a major pursuit, toward self-development without legal compulsion" has been summarized by Bittner (10). Altho the educational needs of adults are still vague and undefined (46), there is a rising recognition of the values in education for older people (24, 45, 93). A number of special courses for elderly people have been developed within the framework of universities and university extension programs (64, 68, 88), but the problems of determining the appropriate content of such courses have not been solved. It is clear that many experimental courses of this kind need to be tried out. Perhaps our greatest problem is to discover ways and means of maintaining in adults the curiosity and urge for learning that exists in the young.

Summary

Successful psychological adjustment in older people is dependent on their goals, the performance capacities available to them, and the restrictions placed upon their activities by the social and cultural environment in which they live. With increasing age, the needs and goals of individuals undergo alterations, but the nature and extent of the changes are still largely unknown. Much more is known about age changes in capacity for mental and physical performance. Many of the known decrements in physical and perceptual capacities have little significance since they can be corrected, or adjustments in living can be made, if the aged persons can be taught to accept them and to live within their limitations. The ambivalent attitudes of our cultural pattern accentuate the difficulties of adjustment in older people since we have not yet defined socially acceptable roles for older people. Satisfactory solution of the problem depends on education, both of the individual and the community.

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CHAPTER IV

Personality Development

ROSS STAGNER

THE most interesting features to be detected in the literature on personality development in the 1950-1952 period are those relating to the changing focus in theoretical and research emphasis. There has been a substantial increase in the volume of writing on theoretical problems in the field, and particularly, the conceptualization of personality in perceptual terms has been expanded. In research, parallel to this, there has been an increased number of studies built around perceptual hypotheses, or using perceptual theory to interpret findings.

Neither of these trends, of course, is exactly new. The current concern with "perception of self" and "the environment as perceived" evokes memories of William James, George Herbert, and Mary Calkins. These concepts have simply been elevated once more to a position of prominence in psychology, just as the tachistoscope, so much used today, also had its vogue some 50 years ago. What is truly new is that psychologists are now integrating an enormous mass of material on child behavior, parent-child interaction, transmission of the culture, delinquency, neurosis, group membership, and group conflict in terms of a coherent and congruent set of categories.

Emphasis upon personality as a set of responses was natural in the theoretical climate of the 1930's, with a sophisticated behaviorism providing the main trend in theorizing. Hence we had research on frequencies of smiling, nail biting, and other specific behavior patterns in the child, but, often enough, precious little information about how these responses fitted into a picture of the child as a functioning individual. In recent years it has become clear that the same overt response has different implications according to the context, and that the same parental act has different significance for different children, depending on how they perceive it. A traumatic experience for a child who perceives himself as weak and helpless may be an experience leading to constructive development for the child who perceives himself as strong and capable. Thus, today, we still use data on the overt responses of child and parent, but we fit them into a total context: how is this act perceived by the parent? What is the meaning of this to the child?

Fortunately, this has not led to a narrow concentration of research on perception as an isolated function. The borderline between perception and other categories, such as motivation, actually seems to be breaking down. The new prevailing pattern might be described as a functional psychology of personality development, in which the child's growth is seen as a func-

tion of motivation, cultural background, family emotional atmosphere, and specific learning.

A book which owes its importance mainly to the success with which it has crystallized this trend and brought together in one place much of the relevant research, is the volume by Blake and Ramsey (9), presenting papers by a number of specialists in this area. While these are not all equally good, the general level is high. Development of general personality characteristics is treated especially well by Frenkel-Brunswik, but other excellent chapters are those by Klein, Bronfenbrenner, and Bruner. Dennis ably discusses the child's perceptual and cognitive development, and Rogers has a short but stimulating chapter on therapy as perceptual reorganization.

Another item of general interest, presenting a conception of how the child's personality becomes organized, is that of Tryon and Henry (85). Their viewpoint stressed the importance of group expectancies, how the family and other groups expect the child to behave; personality develops as he learns to perceive these expectancies and conform to them.

The number of articles which could be cited in support of this general trend is too great for inclusion here. The utility of the approach will become apparent as we consider some of the specific areas in which significant progress has been made.

The Importance of Early Experiences

Research findings have continued to stress early experiences as decisive factors in personality development. Ribble, of course, attracted wide attention with her rather extreme statements about the role of physical "mothering" of the infant. Pineau (61) subjected her arguments to detailed examination and showed that many of her assumptions were completely unjustified, especially as to the physiological instability which was said to necessitate physical fondling and care. Despite Pineau's logic, evidence continued to pile up regarding the great psychological importance of treatment of the infant; for example, Banham's observations (6) on the development of affection, gave confirmation on this point. Pattie and Cornett (58) found, as have other investigators, that a preponderance of unpleasant "earliest" memories was associated with personality disturbances in two of their three groups. Purcell (64) reported that college students with more unpleasant early memories were more insecure. Of course these memories did not extend back to infancy, but they may have reflected the subject's feelings about his early childhood. Bodman, MacKinlay, and Sykes (12) confirmed for English children what has generally been accepted in this country since the work of Goldfarb, that children placed in an institution at an early age fail to mature socially and personally at a normal rate.

An interpretation of these kinds of data in terms of homeostasis and perception was offered by Stagner (80). Once a child comes to perceive adults as sources of warmth and protection, confirming experiences will

be accepted and remembered, whereas conflicting experiences tend not to be noticed. On the other hand, a child who perceives adults as threatening and punitive will find all kinds of evidence to support his view and ignore evidence supporting the contrary opinion. Thus it may be that Ribble was right, but for the wrong reasons.

Parent-Child Interactions

If all mothers perceived their children as pleasures and gratifications, there would no doubt be fewer emotionally disturbed children. But, as Wallin and Riley (87) have noted, mothers even during pregnancy may have a rejecting attitude toward the new baby. As might be expected, in such cases the infant's personality development was found to be handicapped. This was true for the second child in a family, not so much for the first-born.

Continued interest was shown in the extent to which children resemble their parents. Phillips (60) found that parent and child might show the same disturbance, or the child might act out a repressed problem of the parent. Similar observations were made by Sperling (78). The findings can be interpreted in terms of imitation, or in terms of the child's perception of himself in a social role.

More fruitful is the attempt to identify the kinds of behavior by parents which are associated with certain personality problems of children. Cass (15) offered a framework for understanding mother-child relationships in terms of four variables: awareness, identification, projection, and control. She was concerned with the degree to which the mother was "aware" of the child's needs and problems (accuracy of perception) and the extent to which the mother imposed controls on the expression of needs. She also studied identification of child with parent, and projection of parental traits upon the child. As might be predicted, children with special personality problems were likely to have mothers who had little awareness of the child's needs, but who imposed a high degree of behavioral control. In a somewhat similar vein, McKeown (47) found that encouraging behavior was fairly common among the parents of his group of normal children but was quite rare among parents of schizoid or behavior problem children.

Sopchak (76) reported that boys who identified with their fathers had generally better adjustment (as measured by the Minnesota Multiphasic Personality Inventory), thus confirming what would be predicted from analytic theory. However, he found that girls who identified with their mothers tended somewhat toward poor adjustment! Since this contradicts other studies, we suggest that some unknown factor affected his results. Morris and Nicholas (52) published an interesting study on children with what they call "primary behavior disorders," related to the loose rubric of psychopathic behavior. Rorschach tests were administered to the child

and to both parents. They found that (a) children and parents had numerous traits in common, and (b) both parents often showed pathological personality trends, but not to the degree shown by the child. They suggested that some behavior difficulties are genogenic (determined by heredity), others psychogenic (products of experience), and others physiogenic (results of physiological difficulties).

The child's experience with his parents transfers to other adults, and he perceives the world as modeled to some extent on his early home life. Sorokin (77) studied college students who indicated on an attitude questionnaire that they believed people in general to be essentially "good" or essentially "bad," that is, those who accepted the possibility of peaceful, altruistic, cooperative relations with others versus those who felt that human social relations obeyed the "law of the jungle." The former group reported substantially more pleasant relationships with their own parents, the latter, more unpleasant relations with parents.

The difficulty of understanding parent-child relations without knowing the surrounding cultural context is vigorously illustrated by Erikson's excellent volume (25). He studied childhood in primitive societies in comparison with modern American culture. His observations indicate that manifestations of affection, anxiety, and aggression may be quite different in different cultures, and the significance of a specific parental act varies with the cultural background against which it is perceived.

Developmental Stages

The psychoanalytic approach to personality still dominated research on stages of development during this period. Three interesting investigations dealt with the so-called "oral character," or the trait of "orality," as it was phrased by those with doubts about Freudian typology. Goldman-Eisler (30), continuing her researches on the problem of orality, attempted to verify the hypothesis that early weaning is related to oral pessimism. By the use of factor analysis, she showed that it probably would be necessary to recognize two factors, early oral frustration and impulsive aggression, to explain the development of this pessimistic outlook on life. (As will be noted later, it is still generally agreed that frustration leads to aggression; however, early oral frustration may lead more specifically to an expectancy of deprivation than to hostility as such.)

Like many other investigators, Thurston and Mussen (84) found no relation between oral traits of college students (as indicated by Thematic Apperception Test protocols) and nursing gratification as reported by their mothers. The authors were therefore critical of Freudian theory. Not so Blum and Miller (11), who used a rather novel technic in their study of orality. They counted the number of nonpurposive mouth movements (thumb-sucking, licking, bubbling, tongue motion) on a time-sampling basis for young children. Those giving high proportions of such movements were, in general, those with an extreme interest in food (also

oral) ; and they tended to be social isolates, as the analysts predicted. There was also some tendency for them to show more need for liking and approval, more concern over giving and receiving, and less bored tolerance than the opposite group. All of these fit with the analytic interpretation of orality.

The "Critical Period" Hypothesis

The notion that the child develops thru a series of fairly uniform, predictable stages is associated with an insistence that there are specific "critical periods" during which certain traits are more likely to be determined than at other times. Stendler (81) examined the problems of socialization, with particular reference to overdependency, in the light of this theory, and found that the evidence generally favored it. The child, she asserted, tends to develop an expectancy that it will be cared for and protected, and if independence is not permitted at the crucial period, overdependency will result.

The "critical period" hypothesis is of a type which lends itself well to animal experiments for verification. Scott, Fredericson, and Fuller (73) worked with dogs and found general confirmation of the theory. Kahn (42) also demonstrated (with mice) that earlier trauma has a more demoralizing effect than one at a later age. Since the specific ages differ with different species, we shall have to have careful studies on human infants before we can determine the precise "critical periods" for the formation of particular aspects of personality.

Frustration, Aggression, and Delinquency

Another area of research interest during this period was that roughly delineated by the so-called "frustration-aggression hypothesis." Hollenberg and Sperry (37) provided experimental confirmation of the hypothesis that a highly frustrated child would be aggressive in doll play. Children subjected to excessive control at home showed a significantly greater frequency of aggression than those not so restrained. Sears (75) confirmed this, noting also that the relationships may be complex. His interpretation of attacks on parent-dolls (that the children were surprisingly low on anxiety about parental punishment) probably should be rejected in favor of the view that children quickly learn under what circumstances it is safe to express aggression. This may be especially true when the need to act aggressively is strong. Rabe (65) showed that mice likewise were more intensely disturbed by a frustrating situation if it closely followed another frustration—in other words, that frustration effects were cumulative. This, of course, supports the studies on human subjects.

Negativism as a phase of the child's personality is likely to be acute about the ages of two and three years. Ausubel (4) offered an interpretation of this phenomenon in terms of the frustration suffered by the child

when parents stop providing "unlimited service" and begin imposing demands. He called this phenomenon "ego devaluation" and suggested that aggressive negativism was the only ego defense available to the child.

Delinquency is often a consequence of aggression by the child against parents and other authority figures. Jackson (39) and Cass (16) reported that family factors were often involved in the determination of delinquency. A disturbed emotional atmosphere, with little awareness of the child's needs, seemed to be important. Schachtel (71) found Rorschach evidence to support the view that delinquent behavior was a form of aggression against authority. Kates and Harrington (43) obtained somewhat roundabout evidence for the same conclusion. Those delinquents who had membership in a "supporting group" (one having an anti-social code) did not improve under permissive group treatment, whereas another group, characterized by excessively strong, aggressive impulses and no supporting group, benefited materially by such permissive handling. Hathaway and Monachesi (35) showed that the MMPI can be used with some success to predict delinquency in high-school children. Their study is unique in that they actually administered the personality test and followed up the subjects two years later. Most so-called "predictive" studies are made *ex post facto* and are subject to a variety of vitiating factors.

One of the most important studies of delinquency ever undertaken came to a somewhat disappointing end. Powers and Witmer (62) published an over-all report on the Cambridge-Somerville Youth Study, which began in 1935. After an elaborate matching process, 325 boys were placed in a T (treatment) and 325 in a C (control) group. Each group included both prospective delinquents and prospective nondelinquents. Those in the T group received special personal attention from a counselor, plus medical care and some special tutoring as needed (but no psychotherapy or family modification). At the end of the study various indices showed an actually greater frequency of overt delinquent behavior among the T boys! Thus the view that "all a boy needs is a good friend to keep him out of trouble" goes by the board.

Social Class and Personality

No mention was made in the preceding section of studies showing that delinquency is related to social class status, since this has been proved too many times already. What is needed is a better analysis of the social class differences in family treatment of children, in expectations imposed upon the child, and in his perceptions of possible goals and ways of attaining goals. Material progress can be reported in this more fundamental approach to the problem of social class as a factor in personality development. Cooper (20) and Apple (3) offered general discussions of the expectancies, rewards, and punishments encountered by the child as he learns to adjust to a culture and a class-stratified society.

Aberle and Naegele (1), in a good article marred by lack of concrete data, showed how middle-class fathers unconsciously "blocked off" certain possible lines of development for their sons. Role expectancies were defined and the son required to adapt to this pattern. The middle-class ideology in America has traditionally required more postponement of pleasure, and Ort (57) therefore predicted that middle-class boys would show more role conflicts than working-class boys. His data clearly supported this prediction. Stouffer (82) dealt with conflicts resulting from role expectations of friendship versus authoritative groups.

Centers (17) showed that adolescents manifested class consciousness and followed the adult pattern of evaluation of occupations. However, the adolescents showed even more upward displacement of their own class status than did adult groups, thus presumably storing up more conflicts for themselves. Girls showed more upward displacement than boys—perhaps merely a function of their lesser degree of contact with economic realities. With older groups, less upward displacement was noted. It is probably significant that Phillips (59) found more evidence for personality difficulty among junior high-school students whose self-evaluation of class status deviated from a status assigned on objective indices. (This could indicate either wishful thinking or conflict induced by the incongruity.)

Social groups tend to differ in the permissiveness of training, middle-class families putting more pressure on their children. Roy (70) found that there were exceptions to this. Restrictive control of preschool children, she reported, decreased with such factors as greater parental education, and more space in the home. Drucker and Remmers (22) surveyed 1000 junior high-school students and found greater frequency of personality maladjustments with lower economic status of family, with parental education less than high school, and with Catholic religious affiliation. However, comparisons of personality problems across economic and class lines offer difficulties. Ellis and Beechley (24) studied 1000 child-guidance clinic patients. When age, sex, and intelligence were equated, the children of large families were found to have less serious emotional disturbances than children of small families. We might infer that in a large family, even a modest amount of emotional deviation by a child is upsetting to the parents and causes them to refer the child to a clinic; whereas parents with one or two children will tolerate more, and will refer a child only for serious problems. An alternative possibility is that problems arising out of economic frustration are more superficial than those arising out of the failure of the child to conform to middle-class standards.

Some of the problems of the middle-class child seem to arise from the fact that clear-cut role models are not offered to him. For instance, Rabban (66) found that working-class children adopt their appropriate sex roles earlier than middle-class subjects; this may be related to the fact that breadwinner status, authority, etc., are more likely to be divided in middle-class homes. Klatskin (44) found evidence that class differences in child rearing were being decreased by current public health education programs.

All of these social class interactions with personality development must be evaluated in the light of American culture as a whole. Maslow (50) edited a special number of the *Journal of Social Issues* devoted to discussions of the culture-personality relationship. While some of the articles were disappointingly thin, the topics discussed are significant and suggestive. The impact of American industrial organization on personality, the developing feeling that one must worry if he is not "having fun," and the personality characteristics fostered by the American culture—these are important. Joffe (41) asserted that the American culture is being modified by an excessive prolongation of adolescence. If young people develop the idea that they must have fun at all costs, and adults refuse to abandon this "fun culture" for mature responsibilities, our country has some real problems ahead. And as these individuals encounter grim reality, they must either painfully abandon old habits and precepts or escape into neurosis or psychosis.

Ethnocentrism and Prejudice

Prejudice between members of different racial and social groups is an explosive problem in the world today. The volume of publications in this area is encouraging, at least in the sense that psychologists are aware of the problem and are actively in quest of relevant data.

Omitting many articles which, in effect, merely confirm the painfully obvious fact that prejudices exist, we may cite a few which offer some new facts or relationships. Ammons (2) showed that even by the age of four, white boys showed clear-cut evidence of anti-Negro prejudice in a southern community. (Many investigators had held it to develop somewhat later.) Springer (79) demonstrated racial prejudices in Hawaii, an area hailed for its general lack of overt discrimination. Zeligs (88) noted that the rationalizations given by children for their prejudices now center more on customs and cultural variation, whereas before the war they had offered physical differences as excuses. The point, of course, is that hostilities continue to be handed down, but the changing cultural climate provides new interpretations of the nature of the out-group. (Note, for example, how easily we switched from "hate the Nazis" to "hate the Communists"!)

The California studies of prejudice, especially as reported in *The Authoritarian Personality*, provided a focus of research and a center of controversy during this period. Psychoanalytic and perceptual theory formed a somewhat uneasy partnership in this project, which has been broadened by several new studies. Frenkel-Brunswik, whose contributions to the earlier research had been well executed, published a new study (28) on the parent-child relationship and prejudice. As in the earlier work, she found that prejudiced children show rigid dichotomizing (good and bad are sharply separated), fear of imaginary dangers, marked aggressiveness, and exaggerated adherence to conventional values such as cleanliness and order. To some extent these characteristics were imitations of parents; in other respects they seemed to reflect a deep insecurity about the child's

relation to his parents. Himelhoch (36) and Gough and others (32) reported studies of prejudice and personality which were generally compatible with the Frenkel-Brunswik investigation. These studies, like that of Campbell and McCandless (13), used objective devices and thus are protected to a substantial extent against the accusation that the California investigators read their own prejudices into their data on prejudice.

An original contribution by Frenkel-Brunswik was the relation of prejudice to "intolerance of ambiguity," the need to classify everything (and everybody) into sharply defined groups. Block and Block (10) confirmed her finding; they used the autokinetic phenomenon as device for estimating "intolerance of ambiguity." O'Connor (56) also confirmed it, using a verbal attitude scale consisting of statements such as "there is more than one right way to do anything." The correlation between the California E scale (prejudice) and the A scale (ambiguity) was .55. She also found that her prejudiced subjects made lower college grades than the unprejudiced; and they did more poorly on a syllogistic reasoning test. This part of her study was confirmed by Rokeach (68), who found that the prejudiced person is literally "narrow-minded." He asked his subjects to give definitions and associations to religious, social, and similar stimuli. The high ethnocentric group used narrow, concrete, specific conceptions, whereas the low group used more broad abstractions.

Can the California studies be considered as giving a general or only a special answer to the psychology of prejudice? One approach would be to use the California instruments in other areas where culturally defined prejudices followed a different pattern. Christie and Garcia (18) compared University of California students with cases from a southern university. The latter group scored higher on both ethnocentrism and authoritarianism, thus confirming the expected relationship. Prothro (63), on the other hand, found that in the deep South, the pattern of prejudice against Jews and other minorities was different from the anti-Negro pattern. In the South, many anti-Negro persons failed to show the other features of the "authoritarian personality." Clearly then, cultural factors determine whether the prejudiced individual will have the "authoritarian" pattern.

Harris, Gough, and Martin (34) found, for California children, a positive association between child's prejudice and parental authoritarian control. No parallel study for a different area could be located. It was interesting, however, to note the work of Radke-Yarrow, Trager, and Miller (67) in Philadelphia. They found that religious prejudice of parents tended to be reflected fairly accurately by the children, but the majority of children were anti-Negro irrespective of parent attitude. Again, it looks as if culture lays down a broad framework within which individual dynamics can operate. On the other hand, if we get out into another culture area, we must re-examine our psychodynamic interpretations of personality—particularly in relation to group hostility.

Altho he presented no original data, Luchins (45) did the field a service by his thoro analysis of the California studies. Some of his criticisms

were apparently sound (for example, the need for independent criteria of prejudice and of personality patterns, and the need for study of the middle group on prejudice), but others were not. For example, if some of his objections were taken literally, they would throw out the whole hypothetico-deductive approach to research, which has been a major factor in psychological progress in the last two decades. Luchins also ignored several studies which met his criteria of objectivity—perhaps because they were published during the interim between writing and publishing his article. The fact seems to be that, today, enough of the original California findings have been confirmed to be quite impressive. Improvement and clarification will result as cultural areas are compared and other limiting conditions defined.

Problems of Minority Children

It is natural to move from the personality of the prejudiced to the personality of the scapegoat. Papers by Goff (29), Goodman (31), and Clark and Clark (19) dealt with some of the emotional and social difficulties of the Negro child. It was not surprising that the Negro children showed a wish to identify themselves with the white child (preferred status) and encountered conflicts as a result. Nor was it startling to learn, from Grace and Lohmann (33), that Negro children show more compliant behavior than whites in hypothetical conflict situations. Actually, of course, the hope of social progress rests on studies of the persecutor, not of the scapegoat; the emphasis is still in the right place.

Sociometric Investigations

While the concern of psychologists with perception and inner aspects of personality has been widespread, studies of social acceptance and such external variables has not disappeared. Several have offered ingenious combinations of the two approaches.

McGuire and Clark (46) studied the characteristics of those accepted and rejected by their age-group at the high-school level. The extensive interview quotations were somewhat more informative than the text in revealing how subtly the school "culture" was transmitted to newcomers, and how appropriate were the concepts of "social climate," "perception of persons," "definitions of situations," and so on. The students quickly learned to perceive certain characteristics as "unacceptable," altho they could not explain why these were undesirable.

A possible depth interpretation of this phenomenon was offered by Miller and Stine (51). The hypothesis (analytically oriented) was that high-school students who were sociometrically high (accepted and sought after) would have fewer pregenital trends (orality, anality, passivity) indicative of relative immaturity. Using story completions, they confirmed the hypothesis except for anal trends, which were commoner in the high

group than the low. (The data of Blum and Miller (11) also showed more orality in social isolates.) As anal characteristics have been alleged to be "middle-class" features, it may be that class valuation was more important than dynamic influence in determining social acceptability for subjects with these traits.

Jennings (40) noted a relationship between sociometric status and attitude toward authority. The "under-chosen," isolated girls looked upon the housemother as a personal authority; the "over-chosen," sought-after girls viewed the housemother almost exclusively in terms of her treatment of the whole group; the middle group fell between these two attitudes toward the authority figure. Scheffler and Winslow (72) failed to confirm her findings; however, they lumped together eight different areas of authority (for example, religious, political, business) without trying to find out whether these were interrelated. Since Jennings' subjects were evaluating an authority figure who was personally close and real to them, a relationship to sociometric status would be much more likely to appear; attitudes toward abstract authorities may be functions of verbal influences.

Age trends were reported in two studies. Horrocks and Buker (38) found that friendship fluctuations steadily decreased from age 5 to 10. When the data were joined to an earlier study of adolescents, it appeared that stability in friendship increased continuously from 5 to 15. Ausubel, Schiff, and Gasser (5) likewise found a steady increase in "sociempathy," or the accuracy of perception of the child's own social status and the status of others in his group. Thus it seems that the instability of early childhood may be a function of "perceptual errors" in evaluating others and in judging social acceptability.

Heredity

The importance of heredity as a limiting or determining factor in personality development has been played down in recent years. Some signs appeared in the 1950-1952 period that interest in heredity is on the upswing. Eysenck (26) did an involved study of 25 pairs of monozygotic and dizygotic twins. He eventually arrived at an estimate of 81 percent hereditary determination of individual differences in neuroticism. Why a statistician as able as Eysenck would reach this conclusion on so small a group and without an independent sample for cross-checking is not clear. Bender (8) interpreted her data on anxiety in schizophrenic children as evidence for a biological condition underlying the schizophrenic breakdown, and the data of Thetford (83) could be similarly interpreted, although he did not commit himself on this point.

Technical Problems

The search for methods of evaluating personality more adequately continued thruout the period. We can mention only a few articles.

Carp (14) raised serious questions about the validity of the concept of psychological "constriction" by demonstrating that scores for constriction on the Rorschach, on play tests, and on drawings failed to agree with each other and also failed to agree with ratings. Cox and Sargent (21) raised some pointed questions about the validity of judgments by clinicians. Martin (48, 49) reported evidence that cast doubt on the validity of Werner Wolff's test for security in children.

Mummery (53) obtained data supporting the validity of the Mummery Ascendancy Score for five-year-old children; Rosenzweig and Mirmow (69) reported further validation of the Rosenzweig Picture-Frustration Study for children; and Elias (23) provided evidence for the validity of the Elias "homelessness" scale. The fact that the three studies confirming test validities were conducted by the authors of the respective tests, while those rejecting test validities were conducted by persons not ego-involved, raises some significant questions regarding test validation problems. Evidently the psychology of personality still has many hurdles to pass in the course of scientific advancement.

In Conclusion

Space limitations have necessitated omitting many interesting studies which might have been reviewed. It was also impossible to point out weaknesses in many of the studies which have been quoted approvingly, or strong points in those which were criticized. Some areas, such as the personality traits of the handicapped and the impact of school conditions on personality had to be eliminated completely.

The psychology of personality development has made impressive progress since the end of World War II. The fusion of clinical, perceptual, sociological, and other approaches, which has been underscored in this review, offers great hope for the future. For at least a few years, the rate of gain looks as if it may be positively accelerated.

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CHAPTER V

Learning Theory

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SOMETIMES the best way to understand contemporary events is to examine them in historical perspective. Such will be the method followed in the present review and evaluation of recent developments in the psychology of learning.

The Reflex Arc Versus Consciousness

An examination of psychological literature around the year 1900 reveals the beginnings of a struggle between two conceptions of this science which was to occupy future theorists and investigators in an extraordinarily vigorous and creative controversy. Like most of his predecessors, Ladd (20), writing in 1902, defined psychology as "the systematic description and explanation of the phenomenon of consciousness, as such." But at that point Dewey (5), in a paper published in 1896, had already voiced the growing dissatisfaction with this approach and had indicated the conception which was to go far toward replacing it. Said Dewey:

That the greater demand for a unifying principle and controlling working hypothesis in psychology should come at just the time when all generalizations and classifications are most questioned and questionable is natural enough. It is the very cumulation of discrete facts creating the demand for unification that also breaks down previous lines of classification. . . . The idea of the reflex arc has upon the whole come nearer to meeting this demand for a general working hypothesis than any other single concept. It being admitted that the sensori-motor apparatus represents both the unit of nerve structure and the type of nerve function, the image of this relationship passed over into psychology, and became an organizing principle to hold together the multiplicity of fact. (5:357)

While "behaviorism" was not to find its most explicit spokesman for another decade, it is clear that by the turn of the century the study of "consciousness, as such" was rapidly giving way to a lively interest in something called *behavior*. Thus, as early as 1904 Cattell was able to observe:

It seems to me that most of the research work that has been done by me or in my laboratory is nearly as independent of introspection as work in physics or in zoology. The time of mental processes, the accuracy of perception and movement, the range of consciousness, fatigue and practice, the motor accompaniments of thought, memory, the association of ideas, the perception of space, color-vision, preferences, judgments, individual differences, *the behavior of animals and of children*, these and other topics I have investigated without requiring the slightest introspection on the part of the subject or undertaking such on my own part during the course of the experiments. It is usually no more necessary for the subject to be a psychologist than it is for the vivisected frog to be a physiologist. (4:180, italics added)

Why the reflex arc was so attractive a concept at this juncture it is not hard to discover. Physiologists, by disregarding consciousness and con-

centrating upon the "involuntary" responses of organisms, were manifestly making more progress than were psychologists, dedicated as they were to the "description and explanation" of consciousness. But more important still, the reflex, with "stimulus" and "response" as its anchor points, put the organism into a vital relationship with its *environment* and thus articulated with the growing impact of evolutionary thought.

Whereas psychologists had been concerned traditionally, and relatively unfruitfully, with a particular process occurring *within* living organisms, the new approach put the accent upon *external* events: stimulation and overt reaction. And despite philosophical and other objections which were to be raised against it, this reorientation provided a release from deepening pessimism and opened hopeful new vistas. With a single, clean stroke, the organism—the "O" as we shall later designate it—was obliterated, and in its place were put two abstractions, *S* and *R*, with only a thin, equally abstract arrow connecting them. While this bold conceptual innovation, first fully chronicled and rationalized by Watson (48), was "oversimplification" with a vengeance, it was not an unproductive one and set psychologists on a road which was to lead to much undiscovered territory.

Conditioning, or "Stimulus Variability"

In his excellent history of "reflex action," Fearing (7) repeatedly refers to the quality of "invariability" which reflexes are alleged to possess. From the outset this property was an embarrassment to psychologists who were attempting to make the reflex arc the cornerstone of a new psychology, embarrassing chiefly for the reason that anything approximating an adequate theory of behavior *must* provide for the occurrence of change, plasticity, learning. The classical conception of the reflex was in this respect singularly deficient.

A partial solution to the problem was, however, soon to emerge. In 1901, while studying certain digestive reflexes, notably those of salivation, a Russian physiologist by name of Pavlov (37) observed what he later referred to as the "so-called psychic secretion of some of the glands." The "physiologically adequate" stimulus for salivation is, of course, food (or some irritant) placed directly in the mouth. But Pavlov soon noted that his laboratory subjects (dogs) would salivate upon the mere *sight* of food. His investigations were soon to show that any *other* stimulus, such as a sound or touch, which *regularly preceded* the introduction of food into the mouth, would likewise acquire the capacity to elicit the salivary reflex.

In one respect, then, reflexes were *not* "invariable": the stimuli capable of producing them could be extended by the simple expedient of regularly pairing a new, formerly neutral stimulus with the original, physiologically adequate one. Considerably later it was also to be shown that reflexes can be altered by "habituation," which is almost certainly a form of learning (8). Such findings have caused some writers, for example, Holt (12), to

consider the possibility that learning may even be involved in the *development* of the reflexes.

Pavlov termed this process "conditioning." It was to increase greatly the attractiveness of the reflex-arc concept for psychologists as the basic unit of behavior, and Pavlov himself saw many of the new possibilities thus opened up, and vigorously exploited them.

Our starting point [he said] has been Descartes' idea of the nervous reflex. This is a genuine scientific conception, since it implies necessity. . . . Thus a stimulus appears to be connected of necessity with a definite response, as cause with effect. It seems obvious that the whole activity of the organism should conform to definite laws. (37:7)

Not only is the concept of the reflex scientific; it is congruent with the self-regulatory property manifested by all living organisms. As Pavlov observed:

If the animal were not in exact correspondence with its environment it would, sooner or later, cease to exist. . . . The animal must respond to changes in the environment in such a manner that its responsive activity is directed towards the preservation of its existence. . . . Reflexes are the elemental units in the mechanism of perpetual equilibration. Physiologists have studied and are studying at the present time these numerous machine-like, inevitable reactions of the organism. (37:7-8)

In England the move to establish an objective psychology had made extensive use of the concept of *instinct*. Pavlov was quick to recruit this movement to his own, and his strategy was this:

We owe to the English philosopher, Herbert Spencer, the suggestion that instinctive reactions are reflexes. Ample evidence was later advanced by zoologists, physiologists, and students of comparative psychology in support of this. (37:9)

It follows from all this that instincts and reflexes are alike the inevitable responses of the organism to internal and external stimuli, and therefore we have no need to call them by two different terms. Reflex has the better claim of the two, in that it has been used from the very beginning with a strictly scientific connotation. (37:11)

But perhaps the greatest appeal which Pavlov's approach held for psychologists came from the fact that it articulated with an interest of long standing. Psychologists had often concerned themselves with stimuli as the source of "sensations" and had talked, albeit somewhat vaguely, about "perceptions"; but it remained for Pavlov to put the problem of "signaling" and meaning in a broader frame of reference, one which biologists as well as psychologists could appreciate. Like Sherrington (40), Pavlov was struck by the capacity of living organisms, thru the "special senses," to react to significant objects and events *at a distance* and in this way to achieve very great biological advantages; but it was the latter investigator who gave this observation its broader, more sweeping implication.

Noting that the "psychic reflexes" will occur in an animal only if its cerebral cortex is intact, Pavlov attempted to put his theory most generally as follows:

How can we describe, in general, this difference in the dynamic balance of life between the normal and the decorticated animal? What is the general mechanism and law of this distinction? It is pretty evident that under natural conditions the normal animal must respond not only to stimuli which themselves bring immediate benefit or harm, but also to other physical or chemical agencies—waves of sound, light, and the like—which in themselves only *signal* the approach of these stimuli; though it is not

the sight and sound of the beast of prey which is in itself harmful to the smaller animal, but its teeth and claws.

Now although the *signalling stimuli* do play a part in those comparatively simple reflexes we have given as examples, yet this is not the most important point. The essential feature of the highest activity of the central nervous system, with which we are concerned and which in the higher animals most probably belongs entirely to the hemispheres, consists not in the fact that innumerable signalling stimuli do initiate reflex reactions in the animal, but in the fact that under different conditions these same stimuli may initiate quite different reflex reactions; and conversely the same reaction may be initiated by different stimuli. (37:14)

Here, surely, was a new platform for psychology, with exciting research potentialities! The basic phenomenon of conditioning, of "stimulus variability" (or "substitution"), soon lent itself to a wide range of investigations concerning such processes as extinction, spontaneous recovery, disinhibition, generalization, discrimination (differentiation), etc. Indeed, by the third decade of this century, research employing a conditioning methodology and conditioning concepts had reached such proportions as to make it seem to many that "conditioning" encompassed *all* learning and *most* of what could be called psychology, in the fully scientific sense of the term.

But in the two decades just past, the hopes and claims earlier expressed in this connection have become progressively less sanguine. *Something* was wrong. An increasing number of paradoxes began to arise which could not be resolved either on the basis of orthodox Pavlovian theory or any reasonable extension thereof (11). Hull (15), a long-time student and admirer of Pavlov's work, broke sharply with the Russian physiologist's conception of the nature of "reinforcement," that is, the basic process whereby learning takes place. And Pavlov's own attempt, in the latter years of his life, to extend his principles into the field of psychiatry was characterized by a resounding lack of success (38).

At mid-century we are therefore faced by a serious enigma: that campaign to establish a truly scientific psychology which, in its early phases, seemed to have greatest promise has come to a virtual standstill. What is the reason? Was the program intrinsically unsound from the beginning? Or is it sound but incomplete? In order to answer these questions, we must turn back and briefly trace the historical course of a great parallel development in psychological theory and objective inquiry.

Learning as Problem Solving

Prior to 1900 the most influential American writer on the subject of "habit" was William James. Phrases and concepts from the chapter on this topic in his *Principles of Psychology* (16) found their way into the common culture as well as professional literature and exercised great influence in both areas. His central hypothesis, expressed in a variety of picturesque and vivid images, held that habits are strengthened whenever they occur. Thus "repetition, or exercise" was the "first law of habit"; and, as a corollary, it was believed that habits could similarly be weakened

or eliminated only by an "act of will" which prevented their occurrence for a sufficiently long time to allow for a process of natural decay to obliterate the "brain paths" on which the habits were presumably dependent.

A path once traversed by a nerve-current [James said] might be expected to follow the law of most of the paths we know, and to be scooped out and made more permeable than before; and this ought to be repeated with each new passage of the current. (16:108)

Dr. Carpenter's phrase that our *nervous system grows to the modes in which it has been exercised* expresses the philosophy of habit in a nutshell. . . .

If practice did not make perfect, nor habit economize the expense of nervous and muscular energy, he [man] would therefore be in a sorry plight. (16:112-113)

James was not, however, unaware of *another* form of learning. In chapters on "The Functions of the Brain," "Some General Conditions of Brain-Activity," and "Association," he showed a good grasp of what was later to be termed conditioning. In fact, he even went so far as to reproduce Meynert's earlier (1874) "brain-scheme" (really a constellation of reflex arcs) purporting to show how a child, once burnt, will thereafter avoid touching a candle flame. This is a clear instance of "avoidance conditioning." James was thus well aware of the role of both contiguity *and* "exercise," or "practice," as processes whereby learning may take place.

But it remained for one of James's students, Thorndike, to pick up the concept of "habit" and carry its analysis forward in a unique and useful way. Thorndike was certainly one of the first "behaviorists" in the sense of perceiving that psychology *as science* could be advanced more by studying behaving organisms than by introspective and speculative treatises concerning consciousness, a position he vigorously defined in his first major research report in 1898 (42). Here he was concerned primarily with *method*, but a little later he introduced a major innovation in theory. Thorndike (44) continued, in the Jamesian tradition, to accept (at least for a number of years) exercise as the first law of habit. He said:

When a modifiable connection is made between a situation and a response, that connection's strength is, other things being equal, increased. (44:2)

But Thorndike went beyond James in proposing a second, his not well-known and oft-quoted Law of Effect:

When a modifiable connection between a situation and a response is made and is accompanied or followed by a satisfying state of affairs, that connection's strength is increased: When made and accompanied or followed by an annoying state of affairs, its strength is decreased. (44:4)

While his early researches won for Thorndike a secure reputation as a proponent of objective methods in psychology, his notions regarding the action of punishment and reward—in part, no doubt, because of the particular phraseology in which they were often couched—were less readily received. Indeed, as late as 1931, Thorndike (43) was prompted to observe that his law of effect had been, for the three decades since its first formulation, an "unpopular doctrine." This had been a period during which "conditioning" had swept the field, but Thorndike never capitulated.

The poles apart in theory, Pavlov (37), writing in 1927, gave Thorndike

credit for introducing in America objective experimental methods at about the time that Pavlov, "being then quite ignorant of his researches," was beginning his own work in Russia. "We may fairly regard the treatise by Thorndike, *The Animal Intelligence* (1898), as the starting point for systematic investigations of this kind" (37:6).

Thorndike described his own misgivings concerning the conditioned reflexes as follows:

I must admit that the reported phenomena of the conditioned reflex are a mystery to me in many respects. Just what their relation to ordinary learning is I do not know, but I am not convinced that they show its fundamental pattern and most general principles. (43:113)

This statement of faith (or doubt?) has been, in large measure, vindicated by developments during the past 20 years, particularly by the work of Hull and his students. In his 1943 book, Hull (15) advanced both empirical and logical support for the view that *all* learning is dependent upon what he called the principle of "primary reinforcement." He said:

Whenever a reaction (R) takes place in temporal contiguity with an afferent receptor impulse (s) resulting from the impact upon a receptor of a stimulus energy (S), and this conjunction is followed closely by the diminution in a need, . . . there will result an increment . . . in the tendency for that stimulus on subsequent occasions to evoke that reaction. This is the "law" of primary reinforcement. (15:71)

It has already been suggested that the hypothesis as to the reinforcing state of affairs adopted in the present work is distinctly related to that of Thorndike's "law of effect." (15:80)

Hull felt that Pavlov, on the other hand, had seriously erred in proposing a form of reinforcement independent of that provided by drive reduction. He said, in part:

Pavlov differs from the law of reinforcement by regarding as the critical element of the reinforcing state of affairs the occurrence of S_u , in this case the *onset* of shock. On the other hand, the critical element in the reinforcing state of affairs by our own hypothesis is the reduction in the drive receptor impulse . . . which accompanies the reduction of the need, i.e., reduction of the physiological injury to the tissue of the feet, caused by the termination of the shock.

It is an easy matter to show the inadequacy of Pavlov's formulation as a general theory of learning. . . .

It is not difficult to understand how Pavlov could have made such an error. His mistaken induction was presumably due in part to the exceedingly limited type of experiment which he employed. (15:78-79)

Hull attempted to show, in considerable detail, that Pavlovian learning, or conditioning, is really just a "special case of ordinary learning [drive-reduction] reinforcement," thus establishing, at least *per hypothesis*, a unified conception of the learning process, one which, as we have seen, is obviously related to Thorndike's long-debated Law of Effect.

But in certain respects, Hull's attempt to establish a single-process theory of reinforcement in terms of drive reduction has fared no better than did Pavlov's effort to make reinforcement exclusively dependent upon the contiguity, or paired presentation, of stimuli. It is not necessary here to review all of the evidence and arguments which have now been advanced by way of indicating the inadequacy of Hull's theory as a *universal* expla-

nation of learning (28). Suffice it to say that Hull's attempt to establish a monistic conception of learning seems to have bogged down about as completely as did Pavlov's earlier effort. The task which is therefore now before us is to reappraise the contributions of these great investigators of the recent past and see if they can be integrated to open up the way for vigorous and productive new scientific accomplishment.

A Constructive Synthesis

Sensing the inadequacies inherent in both the conditioning and instrumental-learning formulations, a school of writers which may be loosely referred to as the Wholists have kept up for the past quarter of a century a barrage of criticisms, both serious and trivial. They have, in effect, proclaimed a "plague on both your houses" and attempted to show that the real key to psychological knowledge lay in a different direction. While writers of this persuasion have from time to time reported empirical findings which are interesting and valuable in their own right, they have performed their greatest service, it would seem, in continuing to remind us of the more ultimate objectives which a comprehensive conception of learning must set for itself and in fomenting dissatisfaction with answers that were too simple and too easy. Allport (1) and many others deserve much credit in this connection; but Lorenz (21) probably expresses the views of most sober thinkers, not only in psychology but in biology, when he says that wholism, by its very nature, lacks both the materials and the tools required for sound scientific progress. However, in the dialectical sense, it has not been without value. Lorenz says:

The conception of the "whole" was to vitalists the very essence of what never could be explained, being the direct consequence of a preternatural factor. Particular stress was laid on the thesis that a whole could never be explained by synthesis of particulate elements. To this fatal resignation of analysis on the vitalistic side mechanists replied by trying to synthesize all the systems of behavior on the basis of too few elements. This "atomism" is an error very characteristic of mechanistic schools. This optimistic attempt was, of course, doomed to failure, but not before it had brought valuable results. Even very crude simplisms have done less damage to the progress of science than resignation.

It is an everlasting merit of Gestalt psychologists to have been the first consciously to introduce the method of a truly correlative analysis of organic systems. . . . Gestalt psychology should have undertaken to correct the atomistic errors of behaviourism and of reflexology and to introduce the method of a correlative analysis into the study of behaviour.

There is not a single organic system which is really a "Gestalt," nor one that is a mosaic. Every real organic system is built up on *both* principles, mutual interaction of correlated parts playing a role as well as particulate elements influencing the whole in one-way causation. (21:224-25)

Vitalists overrate the "whole" and totally neglect the particulate element, mechanists neglect regulative interaction and overrate those particulate independent elements which they happened to succeed in isolating. Of these errors the mechanistic one is obviously far less detrimental to research than the "Gestalt" psychological one. (21:226-27)

It has now been shown that while neither the elementalism of Pavlov nor that of Hull (or Thorndike) is completely self-sufficient, the wholistic

approach has likewise failed to generate a theoretical system of high explanatory and predictive power. The possibility remains, however, that contiguity theory and drive-reduction theory, taken *together*, may transcend the limitations of each alone and may carry us substantially nearer that understanding of the organism-as-a-whole which others have so heavily stressed.

In 1947, the present writer (27) reviewed the mounting support for the position that Pavlov and Hull were *both* right (tho both also partly wrong) and has since added further logical and experimental considerations in substantiation thereof (28, 32). But perhaps the most dramatic evidence for a "two-factor" conception of learning is the fact that the Polish neurophysiologist, Jerzy Konorski, on the basis of an almost completely independent line of work, has come to virtually the same position. In the English translation of his 1948 volume, *Conditioned Reflexes and Neuron Organization* (18)—which is only just now becoming known in this country—Konorski maintained that a comprehensive behavior theory must, at the very least, distinguish between "conditioning, type one" (sign learning) and "conditioning, type two" (solution learning); and he concluded his stimulating presentation with these words:

For so long as the great edifice of knowledge built up by Pavlov was guided and extended under the direction of that great scientist's genius, it could continue to grow despite its isolation, and despite the fundamental inadequacy of its construction. But since Pavlov's death this science, rent as it is with intrinsic contradictions, submerged beneath a great mass of inexact and arbitrary interpretations of facts, isolated from cognate fields, and with its own specific system of terminology and concepts which is wholly foreign to other branches of neurophysiology, has been unable to make any further progress. And unless a fundamental readjustment, such as we have attempted to make in the foregoing pages, is not made in its basic concepts and standpoint, the physiology of higher nervous activity is bound to suffer degradation in status, and Pavlov's priceless heritage will be largely wasted. (18:260)

And on an earlier page Konorski had already observed:

It must be pointed out that Hull has provided a similar analysis of the experiments [on "conditioning, second type"] we have described. The difficulty which he came up against was due to his attempting (in our view ineffectively) to force the phenomena he analysed into the scheme of conditioned reflexes of the first type. (18:246)

The present writer would add to Konorski's analysis the observation that more accurately, Hull's attempt was to account for *all* learning, including "conditioning, type one," in terms of principles which clearly apply to "conditioning, type two"—and to it only.

A review of Konorski's book or of some of the other studies which have been cited will show how great are the gains in accepting the reality of both conditioning and instrumental learning as two basic, and basically different, learning processes. However, it now appears that in none of these recent works have the potentialities of this dual conception of learning been fully grasped and exploited. In the writer's own previous statement of the two-factor position, he has been inclined to assume that these two forms of learning exist and function, so to say, side-by-side in living organisms, and he has represented them diagrammatically as shown in

Figure I. But it can now be seen that much of what has been said earlier was really pointing toward a conception of these two learning processes which puts them, not side-by-side, but *end-to-end*, as shown in Figure II. It appears appropriate to reconstruct the justification for this particular arrangement.

One of the things which the two-factor position immediately makes clear is that the concept of "conditioning" has been considerably overextended. For reasons which have been developed elsewhere (18), it now appears that the only truly conditionable responses are those mediated by the autonomic nervous system and the visceral and vascular tissues. Overt, behavioral responses, involving the central nervous system and the skeletal musculature, are never, strictly speaking, "conditioned responses." They are, or may be instead, the efforts which the organism makes to solve problems *created* by conditioned reactions. Such efforts may, of course, be alternatively activated by *primary* drives, such as hunger, thirst, etc.

A simple illustration will clarify the foregoing remarks. If a buzzer precedes an electric shock applied to the foot of a dog, the first form of learning is conditioning, whereby the buzzer becomes capable of producing a *fear reaction*. Once this has occurred, the dog, upon subsequent presentation of the buzzer, has a *new problem* to deal with and may now learn, on a problem-solving basis, any one of numerous possible responses for terminating the buzzer (and fear) and also (if the experimental situation is sensibly rigged) for averting the shock.

As early as 1946, Mowrer and Lamoreaux (34) published an article entitled, "Fear as an Intervening Variable in Avoidance Conditioning." And Brown and Farber (3) have since proposed that *all* emotions can probably be usefully conceptualized in objective behavior theory as intervening variables. Thus to suggest now that sign learning and solution learning are *sequential*, rather than parallel processes, is merely to make explicit an implication which has been pretty obvious for some time. Yet Figure II is apparently the first published diagram attempting to represent this relationship. The diagram published in 1950, in *Learning Theory and Personality Dynamics* (28:594), is however a close approximation. Similar diagrams will also appear in Osgood's forthcoming volume (36).

In conditioning, the stimuli, or at least the CS ("conditioned stimulus"), is typically an *external* event of some sort, and the R is typically an *internal* event, such as fear; whereas, in instrumental learning, the stimulus, or "drive," is typically *internal* and the R *external*. What we have manifestly been doing in the past is trying to make all S-R sequences "one-step" affairs, instead of acknowledging that they are often parts of a "two-step" sequence. In looking so industriously for the *external* signs of a CR like fear and leaving our interest and observations there, we have largely neglected its further role in the economy of the "total" organism. Thus, salivation is essentially an internal, physiological reaction; and Pavlov's conditioning experiments with this reaction always involved a surgical operation which, literally, brought it to the body surface. While Pavlov

FIGURE I

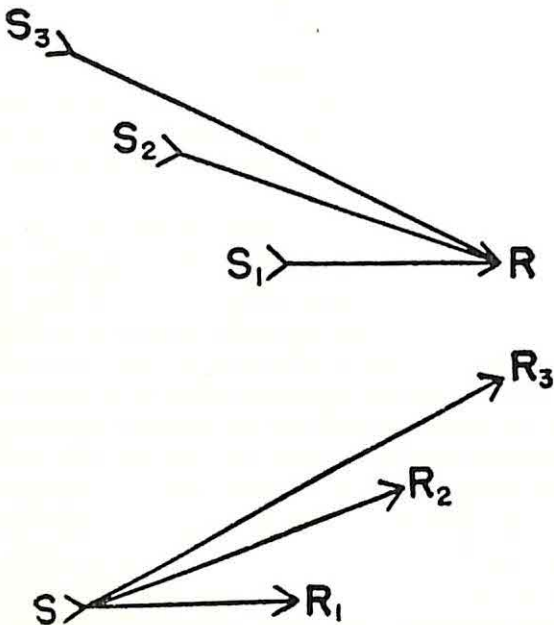
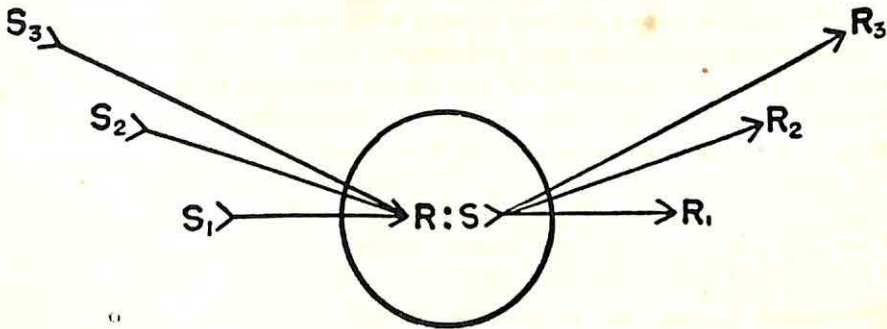


FIGURE II



was, of course, well aware of the digestive and other functions of salivation under normal conditions, he was oblivious to—or at least took no interest in—the *appetitive* accompaniments of this reaction. These, as we now know, have important drive properties, which may activate internal-external sequences, that is, *behavior* in the nonphysiological sense of the term. The external-internal and internal-external type of distinction between responses is certainly implied by Skinner's (41) distinction between those reactions which he called "respondents" and those which he called "operants." As is well known, Skinner was one of the first psychologists to explore the two-factor conception of learning, tho his aversion to subjectivism tended to keep him from formulating a unified two-stage conception of behavior.

It may be objected that there is really nothing novel in what has just been said. For example, has not the concept of response "chaining" often been used in the past? Yes, to be sure; but "chaining" is a device employed, rather feebly in most instances, by inveterate conditioned-reflexers as a would-be explanation of such performances as are involved in problem-box and maze learning. What is proposed here is by no means the same.

Or it may be pointed out that such an eminent writer as Tolman (47) has for more than 20 years been stressing "intervening variables" and that even Hull has made extensive use of them. Tolman certainly deserves much credit on this score, but the intervening variables in which he has been particularly interested are of a "cognitive" variety which do not readily lend themselves to the type of analysis here proposed. Professor Tolman's theorizing, as represented by his most recent publication (45), has taken a course which has become increasingly difficult to follow.

In Hull's 1943 book (15) there is a good deal of reference to the role of "intervening variables," or "constructs"—such as "habit" and "drive"—in formal theory construction; but there is an almost complete absence of anything approaching the type of thinking represented above in Figure II. Under the impact of experimental facts which Miller (24) and others have been piling up, Hull (13), in his *Essentials of Behavior* (1951), for the first time gingerly introduced *fear* as a systematic concept; but because Hull continued to reject the two-process view of learning, his management of this concept was unsure and awkward (16:21). The generally confused nature of Hull's formulations in this connection is well illustrated by the introductory paragraph of his chapter on "Secondary Motivation."

It is a matter of common observation that situations which are associated with drives themselves become C_D 's. Consider, for example, the case involving tissue injury. The response leading to escape from the injury gets connected to the stimuli and to the traces of those stimuli which are associated with the onset of the injury through the resulting cessation in the drive stimulus discharge (S_D). These antedating stimuli when later encountered will therefore give rise to more or less realistic reproductions of these movements. Now, these antedating stimuli are the new C_D 's, and the proprioceptive stimuli activated by the associated internal or "fear" reactions become the S_D 's of the *secondary drive* or motivation. Finally, the intensity of this combination of stimuli, especially of the proprioceptive internal or "fear" stimuli, through the principle of stimulus-intensity dynamism gives them their distinctive motivational potentiality. (13:21)

Implications and Corroborative Evidence

The Problem of Punishment. According to Thorndike's Law of Effect, reward directly strengthens stimulus-response connections and punishment directly weakens them. Learning is thus a *reversible* process. But such a view overlooks the fact that punishment leads to *conflict*, which it should not do if it operated as the Law of Effect suggests. And it also overlooks the fact that "punishment," applied in other settings, can be used to *motivate* behavior, rather than inhibit it.

The generally unsatisfactory nature of much past theorizing concerning punishment has been discussed elsewhere (29). Here there is space only to note that this phenomenon is readily accommodated in the scheme shown in Figure III (which is merely an elaboration of Figure II). Here we start with some drive (hunger, thirst, or the like), S_{D1} , which habitually produces and is reduced ("satisfied") by some response, R_1 . In the course of its occurrence, this response will produce proprioceptive or other stimuli, S_{S1} . If, now, a punishment, S_{D2} , that is, a sharp increment in drive ("pain"), is applied just after or as R_1 occurs, the circumstances are right for conditioning to take place: S_{D2} will produce the (unconditioned) fear reaction, R_2 , and S_{S1} will become capable of independently eliciting this reaction. When, subsequently, R_1 , under the impetus of S_{D1} , starts to occur, the drive of fear, S_{D2} , is aroused, and the only way this second drive can be resolved is for R_1 to be interfered with, in the simplest case, by some *antagonistic response*, R_3 .

If nervous impulses were always and exclusively "excitatory," then inhibition, brought about by punishment, would have to occur *peripherally*, that is, a response which is being instigated by one drive could be blocked only by another drive acting in such a way as to innervate muscles antagonistic to those involved in the first response. That inhibition is indeed often, at least in part, peripheral is indicated by the common figure of speech, to "stiffen" oneself against "temptation"; (Larry N. Solomon has also called the writer's attention to the expression "bored stiff," as used in social situations in which one is inclined to make responses which would be "impolite"); and in the laboratory it has been shown that if a dog has been taught to flex a forelimb as an instrumental response and has then been punished for making this response, presentation of the stimulus which initially produced the flexion reaction will now cause the dog, if the punishment was sufficiently intense, to contract the *extensor* muscles of the leg (18, 37). But since organisms which are in such a state of conflict, or inhibition, often do not show the degree of muscular tension and tonic rigidity which the purely peripheral mechanism would seem to demand, various possibilities of *central inhibition* have been suggested and to some extent supported by neurophysiological researches. For further pursuit of this matter the reader is directed to the works of Fulton (10) and Brazier (2).

This account of inhibition thru punishment seems adequate to its purpose and is founded upon the assumptions (a) that there are *two* learning

FIGURE III

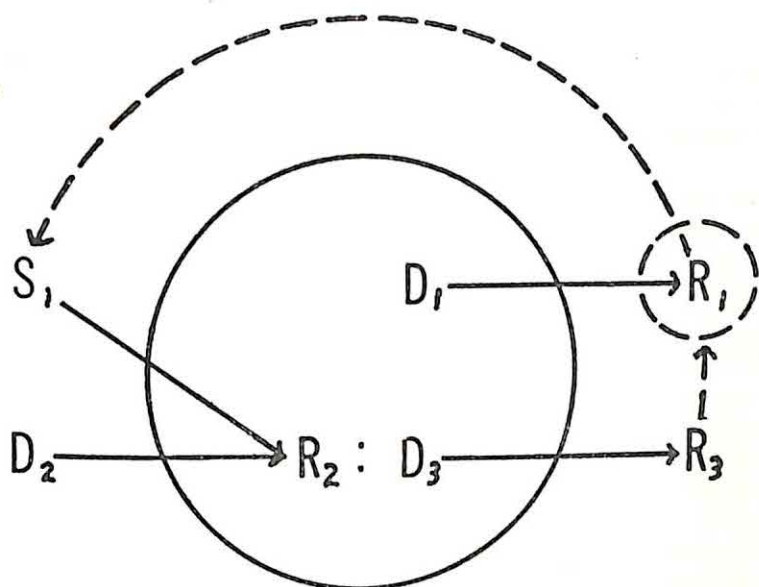
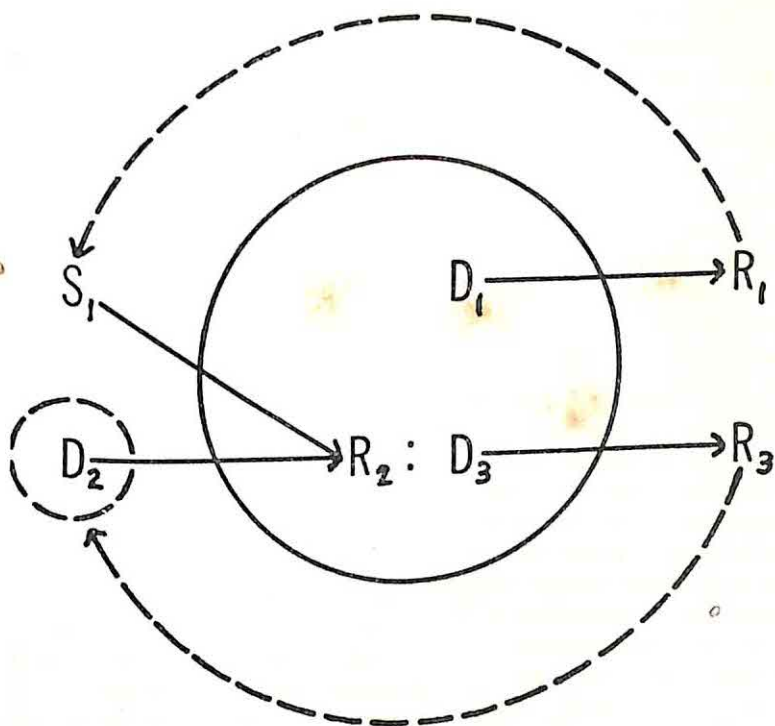


FIGURE IV



processes, conditioning and problem solving, and (b) that responses acquired in these two ways commonly form *sequences* of the kind shown in Figure III.

It should be said that this explanation of punishment, as opposed to Thorndike's theory of direct habit reversibility, is congruent with common experience and clinical observation. It has been most nearly anticipated by Miller and Dollard (25) and, much earlier, by James (16, 17) in some of the writings previously cited. Hull's theoretical system, in its 1943 version, virtually ignored the phenomenon of punishment. With the admission of fear into the 1951 version of the system (13), the way was at least partially opened for consideration of the problem; but, as in the 1943 volume (15), there is discussion only of "Inhibitory Potential" (as it relates to extinction), not of punishment in the usual sense of that term. There is no reason why this topic should be subsequently neglected to the same extent.

Secondary Reinforcement. Some of the liveliest current theoretical controversies and most important investigations in the whole field of learning have to do with secondary reinforcement. Much of this activity centers around two very different conceptions of the nature of this phenomenon.

It has long been known—see, for example, the work of Williams (49)—that specific stimuli or situations which have been associated with basic satisfaction, such as hunger reduction, become capable of serving, in their own right, as "reinforcing agents." In other words, an organism will be rewarded—this can be demonstrated in various ways—not only by reduction in some basic drive (primary reinforcement) but also by an object or by other circumstances which have regularly foretold such a reduction. The question is: How does this process of secondary reinforcement operate? Hull's answer has been that secondary reinforcement is a "conditioned" form of primary reinforcement (13, 15). Miller (23, 24) and others have favored the view that secondary reinforcement is simply the reinforcement which occurs when a secondary drive, of whatever kind, itself undergoes diminution.

The latter conception of secondary reinforcement is thoroly consistent with the two-factor (and sequential) conception of learning delineated in the preceding pages. Thus, for example, punishment as it has been analyzed in this chapter is dependent upon a form of secondary reinforcement: once fear has been connected, by means of conditioning, to a particular response, the response of stopping or reversing that response will be secondarily reinforced by fear *reduction*. Elsewhere the writer (28, 31) has made use of this conception of secondary reinforcement for quite a different purpose, namely to account for the first stage of language learning, both in human infants and in those species of birds which can learn to "talk." Here the central notion is that conventional word noises are first tried and then perfected by babies and birds alike because these noises have been associated with primary drive reductions provided by their human caretakers. When the bird or baby succeeds in making a

noise which is a "reasonable facsimile" of one commonly made by an adult human being in the context of primary reward, such a sound, when self-produced, will have some of the same comforting and reassuring (secondarily reinforcing) qualities as does the sound when made by others. Konorski (19) has independently advanced the same mechanism as responsible for the learning involved in teaching a dog to "shake hands."

"Reasoning" and Mediation Responses. One of the chief criticisms that has been leveled at learning-theory approaches to psychology has been that trial-and-error behavior, no less than conditioning, is "blind," "automatic," "mechanical," "unmeaningful," and thus incapable of providing a satisfactory explanatory basis for the "higher" mental processes and behavioral feats commonly exhibited not only by human beings but also by certain other organisms. It appears that the type of learning theory outlined in this chapter is well on its way to meeting this objection.

One of the first facts that needs to be noted in this connection is that conditioned responses, as here conceived, may have not only motivational properties but also guiding or "cuing" functions as well. Tolman (46) and Muenzinger (35) were among the first to comment upon the tendency of rats at choice points in a maze to move their heads from side to side, as if trying to determine in this way which path to take. At first it may appear that the rats are thus trying to discover some *external* lead, but such tell-tale indicators in the environment will have been carefully eliminated. The only remaining inference is that by means of this VTE (vicarious trial-and-error) behavior, the animal is really producing proprioceptive stimuli which, on previous trials, have been associated with "good" or "bad" consequences of having actually turned and gone one way or the other in such a situation. The animal, in short, is trying to determine how it would *feel* to go this way or that! As indicated at greater length elsewhere (28), this type of activity can properly be regarded as a primitive form of *reasoning* and demonstrates how emotional reactions can serve to *guide* behavior which is motivated by hunger or some other basic drive. More specifically, these emotional reactions, cued off by the head movements, are "orientors" and "organizers" rather than "originators," mediating and directing but not constituting instrumental behavior proper.

As Osgood (36) has pointed out, Hull laid the groundwork for the study of mediational processes. As early as 1930 he wrote:

A reflective consideration of the habit mechanisms involved in anticipatory defense reactions reveals a phenomenon of the greatest significance. This is the existence of acts whose sole function is to serve as stimuli for other acts. We shall accordingly call them *pure stimulus acts*. (14:515)

Such behavior sequences have great biological survival significance because they enable the organism to react both to the not-here and the not-now. Incidentally it accounts for a great deal of the spontaneity manifested by organisms.

The concept of the pure stimulus act appears to be the organic basis of symbolism. (14:524)

But Osgood has also noted that Hull "never fully explored the implications of this mechanism" (36:60). One of the reasons for this was Hull's

determined effort to see all learning as dependent upon a single process and his reluctance to admit emotions to the status of psychological constructs. One of the first reasons for so admitting them was the discovery that the *overt* reactions which living organisms make to danger signals are often *radically unlike* the overt reactions made to the "unconditioned stimulus," that is, the danger itself. Only by positing fear as an intervening variable (the true conditioned response) can this phenomenon—which has been discussed in detail by May (22) and by Mowrer and Lamoreaux (34)—be satisfactorily accounted for. An exploratory investigation by Nygaard, described by Osgood, neatly illustrates the way in which "intelligent," "insightful" behavior may be produced and very simply explained by positing fear as an intervening or mediating response. Osgood says:

Rats are initially given intermittent shocks while held in a small enclosure where the only effective response is *crouching*. The experimental animals have a buzzer sound paired with these shocks, but control animals do not (they hear the buzzer as often, but not coupled with shock). Then all animals are trained to make a *barrier-jumping escape response* to shock which cannot be anticipated and has no signal associated with it. Once this escaping response has reached a criterion latency following the onset of shock, test trials with the buzzer are made. (36:78)

On the test trials it is common for the experimental animals to make an overt response to the buzzer which they have never made to it before, that is, they are likely to make the "barrier-jumping escape response," whereas the control animals, that is, those which received the same preliminary shock training but without the associated buzzer, are much less inclined to make such a response. As Osgood observes:

Since the experimental animals have never had the buzzer stimulus associated with barrier jumping, its occurrence in the test situation must be based upon the mediating anxiety reaction common to both situations. Since the anxiety mediator has been associated with both crouching and barrier leaping, and the buzzer only with crouching, as overt responses, we must consider the prompt occurrence of barrier leaping to the buzzer in the new situation a case of "intelligent transfer" to instrumental sequences "appropriate to" the total situational context. (36:78)

An experiment demonstrating the use of an internal response (emotion) other than fear for mediating "insightful" behavior has been carried out by Mowrer, Kunberger, and Kardash (28, Chapter 11).

The treatment of response mediation, particularly as it applies to the psychology of language, which will appear in Osgood's forthcoming book (36) will be unusually thoro and penetrating. Here it will be seen that this writer explicitly adopts a two-stage response sequence as minimally necessary for an S-R analysis of certain important forms of behavior. He differs, however, from the present writer in continuing, with Hull and others, to believe that there is probably only *one* learning process. However, he gives an excellent review of various two-factor formulations.

Two other psychologists who have become interested in the relationship between learning theory and language problems are Brown and Dulany. In an unpublished manuscript entitled "A Stimulus-Response Analysis of Language and Meaning" they, too, stress the role of mediation; but they

disagree with Osgood in favoring, not only a two-stage conception of behavior, but also a two-factor conception of learning. They say, in part:

In this section arguments have been advanced which militate against the identification of meaning with acts which are either overt or instrumental. . . .

This leaves us saying that, if meaning is to be a response, it must be, as Osgood observes, a mediating implicit response. We should further suggest that this response ought to be classically conditioned. The value of these formulations depends upon the evidence that can be accumulated to indicate that meaning possesses the functional properties of a response.

Learning Theory and Neurosis. One of the most elaborate attempts to date to deal with personality problems and their treatment in terms of learning theory is the recent book by Dollard and Miller, entitled *Personality and Psychotherapy* (6). The central thesis of this book, and one that is equally central to most of Sigmund Freud's writings (9), is that the neurotic person is suffering from conditioned responses, notably *fears*, which have outlived their usefulness and realism and "which in their inexpedience obstruct the stream of life."

The present writer believes that a different conception of neurosis, based upon the type of thinking outlined in this chapter, is more defensible. The essence of this conception is this, that neurosis is less a matter of mis-, or overconditioning that has been produced by overly severe or misguided parents, than it is a matter of the afflicted individual having acquired certain tricks at the level of instrumental or solution learning which *protect* him against conditioning (especially in the nature of "punishments") which, in the long run, would be decidedly to his advantage and best interest. Reduced to the simplest possible form, this view suggests the schematic diagram shown in Figure IV. Because of space limitations this view cannot be properly expanded here, but it has been presented in considerable detail elsewhere and in several articles soon to be published.

Learning Theory and Social Processes. Most learning researches have been carried out with isolated subjects; and when, as sometimes happens, it is discovered that the subject is interacting "socially" with the experimenter, such interaction is most unwelcome. Yet most of the learning of human beings occurs in a distinctly social context, a fact that becomes particularly impressive when one attempts to understand and deal therapeutically with neurotic persons.

Some years ago the writer carried out a series of experiments with rats, as yet only partially reported (26), in which two or more subjects were put into a standard situation and their resolutions of the resulting "social problem" systematically studied. Somewhat later Mowrer and Kluckhohn (33) tentatively introduced *another person* into a stimulus-response analysis of certain learning problems. And recently Sears (39) has discussed this type of extension of conventional learning theory. A few brief excerpts will give the general tenor of his paper.

I have already made reference to the desirability of combining individual and social behavior into a single theoretical system. . . .

Among psychologists, Newcomb, with his exposition of role expectancy, and

Festinger, in his studies of group cohesiveness, clearly exemplify the trend toward combination. In the main, however, in spite of their long prepossession with social influences on the individual, psychologists think monadically (39:478)

But if personality and social behavior are to be included in a single theory, the basic monadic unit of behavior must be expandable into a diadic one. A diadic unit is one that describes the combined actions of two or more persons. A diadic unit is essential if there is to be any conceptualization of the *relationships* between people, as in the parent-child, teacher-pupil, husband-wife, or leader-follower instances. To have a science of interactive events, one must have variables and units of action that refer to such events. (39:479)

It is not necessary or possible here to follow the specific treatment which Sears gives to this problem in the remainder of his paper. Enough has been said to show that learning theorists are beginning to think socially, "diadically," and to suggest that this may soon become an area of considerable scientific and scholarly activity. It is believed that two-factor learning theory, especially when it is elaborated along lines suggested in this chapter, will prove especially adaptable in this connection.

Summary

In this chapter an attempt has been made to put contemporary developments pertaining to learning theory into historical perspective and in this way establish some guideposts indicating the probable direction of future developments in this field. Around the turn of the century a kind of revolution occurred in American psychology which soon shifted the accent from the study and description of "consciousness, as such" to the reflex-arc concept. Pavlov and his school expanded this concept to incorporate the phenomenon of conditioning (sign learning), while Thorndike, Hull, and others, using equally objective approaches, identified and extensively studied trial-and-error (solution learning).

Various writers have attempted to found a complete psychology of learning upon one or another of these principles, but it is now clear that it is not a question of either-or but of *both*. Moreover, it is now apparent that these two forms of learning exist and function, not side-by-side, but end-to-end: sign learning is the process whereby *external* events come to produce *internal* drive states, and solution learning is the process whereby *internal* drive states produce *external*, overt behavior. We thus advance from a simple, and pretty clearly inadequate, S-R psychology to an S-R:S-R psychology. By drawing a circle (O) around the R:S part of this sequence, we not only rediscover the "organism" but we redeem it from the state of "emptiness" to which extreme behaviorism condemned it, and thus begin, realistically, to examine the organism-as-a-whole.

Finally, an attempt is made to sketch some of the implications which this system of thought has for (a) the problem of punishment, (b) secondary reinforcement, (c) "reasoning" and mediational responses, (d) neurosis and therapy, and (e) social psychology.

Figure I. Diagrammatic representation of two forms of learning, conditioning or stimulus substitution (above) and trial-and-error or response

substitution (below). S_1 may be thought of as the so-called unconditioned stimulus; S_2 as a first-order conditioned stimulus; and S_3 as a second-order conditioned stimulus. In like manner, R_1 may be thought of as a first but ineffective response to some drive or problem situation, S ; R_2 as a second attempted solution; and R_3 as a third and successful reaction. Here stimulus substitution and response substitution are represented as more or less *parallel* processes; compare Figure II.

Figure II. The same diagrams as shown in Figure I placed, not side-by-side, but end-to-end, with a circle, or O , added to represent the organism. The colon is used to represent a response-stimulus connection, as opposed to stimulus-response connections (arrows). This sequential arrangement of the two kinds of learning—sign learning, whereby secondary drives become attached to new stimuli, and solution learning, whereby new responses become connected with a particular drive—offers a number of new explanatory possibilities (see text). It provides a scheme whereby “any stimulus” can become functionally related to “any response” more realistically than by either “reflex chaining” or wholistic conceptions.

Figure III. Schematic representation of the operation of “punishment.” Some drive (for example, hunger or sex), D_1 , produces some overt response, R_1 , which leads to, or in the past had led to, a reduction in D_1 . However, R_1 now causes a second drive (“pain” of some sort), D_2 , to impinge upon the organism, O . Simultaneously other stimuli, including proprioception from R_1 , impinge upon O . For simplicity, we may represent this concomitant stimulation by a single stimulus, S_1 . One of the reactions to D_2 will be the internal response of fear, R_2 , which becomes attached, by conditioning, to S_1 . Subsequently, incipient performances of R_1 produce S_1 and R_2 . R_2 produces the fear drive, D_3 . The response which most directly reduces D_3 (and is selectively learned) is one which blocks R_1 . It is, of course, possible for D_2 to be of such a nature as to require for its reduction some overt response which, like R_3 , will block R_1 . But the more usual case is one in which D_2 serves merely to elicit R_2 so that S_1 can become conditioned to R_2 . The final “cycle of punishment,” starting with R_1 , is indicated by the sequence of broken and solid lines. The circling of R_1 by the dotted line extending from R_3 is used to indicate the blocking, or inhibition, of R_1 by R_3 . (For reference to the possibility of central “short-circuiting” in connection with response inhibition.)

Figure IV. Precondition of neurosis represented schematically. As indicated in Figure III, if a response, R_1 , is punished by being followed by D_2 , the resulting overt reaction tendency, R_3 , is commonly one which blocks R_1 . It may develop, however, that R_3 is a *different kind* of reaction, namely one which is “defensive” in that it keeps D_2 from recurring (see broken line extending from R_3 to D_2 and encircling the latter). If O can thus avoid being “caught in the act,” this leaves R_1 free to occur (with suitable precautions) and keeps the S_1 - R_2 connection from being reinforced. However, such a strategy of “avoiding consequences,” or “cheating,” is likely (in human beings, at any rate) to produce guilt which, in turn

dealt with defensively (viz., by repression), sets the stage for neurosis. This interpretation is to be contrasted with the view that neurosis arises when a forbidden form of gratification (R_1) is punished so severely and *so successfully* that neither it nor any alternative mode of gratification can henceforth occur. In the present paper, the assumption is that the neurotic is one who has become adept in *consequence avoidance* rather than one who is a victim of excessive *response inhibition*.

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CHAPTER VI

Psychological Theory as a Determiner of Experimental Pattern in Child Study

BOYD McCANDLESS and SIDNEY ROSENBLUM

Definition of Theory

IN GENERAL, psychological theory as discussed by Gustav Bergmann, in an unpublished manuscript available to the authors, is or should be based on concepts which ultimately, by longer or shorter definitional chains, are defined by immediately observable bits of behavior, and every psychological law should include at least one such concept. Also, a theory consists of a set of laws deductively connected, some of these (fundamental laws, basic laws, axioms) allowing jointly for the deduction of others (theorems) and the deduction of laws as yet untested. In terms of this definition, the authors have decided to restrict their study to three roughly demarcated theories: (a) learning or behavior theory, (b) field and Gestalt theory, and (c) psychoanalytic theory.

It is rather clear in the first place that no such formal structure has as yet been attained in a theory of human behavior. Rigorously speaking, then, few experiments have been theoretically derived. However, in each of the three "theory areas" many theorems have been proposed, a number of empirical relationships have been developed and referred back as evidence related to a theorem of one of the systems, and many experiments and studies have been done with reference to the "theorems" and as checks on previous theorem-related research. This chapter has been broadened to include such studies and experiments.

A second reason for the relative paucity of theoretically determined research in the area of child study is probably the demand for realistic services made on the research worker in this field. Theory, at first glance, has seemed little related to such necessities. Recently, however, the fragmented and unrelated nature of the empirical findings has resulted in the conviction on the part of many people in the field that theoretical integration is a pressing problem, and that theoretical programs of research should constitute a major part of the activity in the field of child study.

A third reason for the rarity (and frequently, the poor quality) of theoretical research in child study is the relative lack of theoretical sophistication possessed by research workers. Most training centers for child research workers have become aware of this situation and seem to be making real progress in correcting it. The relative upsurge of theoretical experimental work in very recent times can be noted in the dates of research reviewed in later sections of this chapter.

The combination of inadequate theoretical grounding and social urgency has resulted in overgeneralization and inappropriate generalization of research. This, in turn, has produced some revulsion against theory on the part of the "hard-headed empiricists" as well as some criticism of the whole field of child study on the part of those who see the "experts" solemnly advocating today what they were renouncing yesterday. Another aspect of this situation is the confusion existing in many workers' minds between value and science, which, of course is again partly a product of the social urgency which underlies the whole field of child study. As Bergmann points out, the basic flaw of some theoretical systems is not in what they have to say, but in their insistence that their way of saying it and presumably, their way of studying it is the only way in which it can be said or studied.

Scope of Review

The authors have been compelled to do much arbitrary selection of materials. By and large, purely clinical studies have been excluded except where reference to theory is made explicit and detailed. This has resulted in the exclusion of the majority of projective technics studies. The authors have not included social class research, except where it is related to one of the three major areas of theory listed above, and have limited drastically the list of level of aspiration studies and frustration, stress, and failure studies, excluding those where the aim was primarily to elicit and describe a repertoire of behavior. Detailed documenting of "parent preference" studies has not been done, altho some of the omitted studies are purportedly derived from psychoanalytic theory. Most sociometric studies were judged to be normative and were excluded.

Studies Derived from Learning Theories

Transposition Studies

Kuenne (42) and Alberts and Ehrenfreund (1) made studies which use Spence's (78) theory of discrimination learning as their frame of reference. Kuenne hypothesized that the processes postulated by Spence to underlie transposition behavior in animals were also operative in young children, but that in the case of older children who possessed the ability to make verbal responses, transposition behavior would become verbally controlled (that is, cued to such verbal responses as "bigger," "higher," "longer"). She utilized children from three to six years of mental age and divided them into two matched groups, with instructions to choose the smaller stimulus of the largest of six pairs of stimuli. She then presented her subjects with test stimuli *near* the training pair and *far* from the training pair to test the hypothesis that the far transposition tests would result in significant differences between children of different age levels,

as well as between those who did and did not verbalize the solution of the problem (either spontaneously or under questioning), whereas the near transposition test would not reveal these differences. Results indicated that, with very few exceptions, all children were able to transpose successfully in the near transposition test, but only older children were able to do so in the far situation. She also discovered that a high positive relationship existed between the subjects' verbalizations of the size aspect of the problem and their transposition scores on the far test: older children tended to verbalize the size cue significantly more often than younger children.

In a study using a procedure similar to Kuenne's, Alberts and Ehrenfreund (1) secured results that they considered striking confirmation of the Spence theory.

A recent research by Terrell (84) suggested by Spence's theory and Kuenne's extension of it, used 48 preschool children as subjects and involved a three-stimulus discrimination situation and two transposition tests. An analysis of the results suggested that transposition behavior of young children is in part affected by whether they received training on a specific instance of a concept ("middle-size") or training on a number of instances of the concept, and in part by whether or not the children had a verbal name available for the concept.

Mediated Generalization Studies

Several studies have been concerned with an empirical investigation of specific concepts and variables directly suggested by Hullian theory. Two which warrant special attention are by Birge (6) and Jeffrey (39). Both deal with secondary or mediated generalization, a phenomenon which can be described as the occurrence of a response to a stimulus to which it has never been conditioned when factors of primary generalization and initial tendency have been controlled. Birge was concerned with the role of verbal responses in the mediation of motor responses and the role of motor responses in mediating verbal responses. Since general procedures in both parts of her experiment were essentially the same, only the first will be described. In stage one of the design she presented her subjects (students from Grades III, IV, and V) with four boxes, each one having a different picture of some nonsense animal on its top. Subjects were taught to give one nonsense name to two of the boxes and a different nonsense name to the other two. In stage two, one of the boxes with each name was used, and the children were taught to reach for one box, under which they found candy, and not to reach for the other, under which there was no candy. In stage three, the subjects were tested for transfer of the motor response (that is, reaching for candy or not reaching) to the two remaining stimuli. Mediation was said to have occurred when the subjects reached for the box that had the same name as the box they had been trained to reach for in stage two. Subjects were divided into four groups on the basis of what verbalizations were required of them during the various stages of

the experiment proper. One group made the initially learned verbal response prior to the motor response in both the candy finding and transfer stages (stages two and three), one group made it in candy finding alone, one in transfer alone, and one in neither. Results indicated that the majority of children in all verbalization groups chose the box in the transfer situation that had the same name as the box they had been trained to choose in stage two. In addition, greatest generalization occurred in the group that overtly verbalized in both candy finding and transfer stages; least took place in the group that had not verbalized at all. The other groups fell between.

Jeffrey (39) investigated the relative effects of verbal and motor responses in mediating an instrumental act using 48 preschool children as subjects. In stage one all subjects were taught a motor response when shown a black stimulus and another motor response when shown a white stimulus. A gray stimulus was then presented to make sure that neither motor response was consistently elicited by that new stimulus. In stage three, one-third of the subjects learned to make the verbal naming responses to the black, white and gray stimuli, and two-thirds of them learned an additional pair of motor responses. In each group, one-half the subjects learned to make the same response to gray as to white while the other half learned to make the same response to gray as to black. A retraining session followed in which the verbal group and one-half the motor group were required to make the stage two response prior to making the stage one response to only the black and white stimuli. The other half of the group was also given a retraining session with just the two original stimuli but was not permitted to incorporate the second response. Stage three required all groups to make the stage one response when presented with the gray stimulus. The individual scores analyzed were the differences between the frequency of a given response to gray during test and retest situations. Mediation was said to have taken place when those children who had learned to make the same stage two response to gray as to black now made the same stage one response to gray as to black with greater frequency than they had in the original test. Results indicated that mediation occurred in all three groups, the most occurred in the verbal group, less in the first motor group. That motor group which had not incorporated the second response in the retraining session showed poor mediation, but the scores were significantly different from chance.

General Learning Study Trends

These studies merit the special attention they have received since they demonstrate that theoretical formulations originally intended to explain the behavior of inarticulate organisms can be extended successfully to the behavior of human subjects. Among other researches, the work of Greer (33) on "inhibition" and "extinction," Wischner (94) on the anxiety-reducing character of stuttering behavior, and Harlow (35) on learning

sets all demonstrate that certain antecedent and behavioral variables can be "experimentally translatable," so to speak, from animal to child subjects. A slightly different approach is exemplified by Rotter's "social learning theory" as described by Jessor (40) which is formulated directly in terms of human goals and needs. Two recent studies related to this theory are those by Cass (11, 12), in which she tested certain parent-child interaction variables, namely "identification," "awareness," "projection," and "control," using young adolescents as subjects. Tho in somewhat rudimentary form at present, Rotter's theory is encouraging in that it demonstrates the possibility of developing a systematic approach with which to explain and predict certain aspects of children's behavior.

The extension of Hullian theory, or some modification of it to complex, symbolic human behavior seems to the authors to represent one of the stronger trends in present child-theoretical research. It is perhaps one of the most promising approaches if for no other reason than that Hullian theory is the most carefully defined and logically consistent of the existing psychological theories. Programs of such research are being conducted at Yale, Iowa, and Ohio State, among others. Among the most promising of such experiments appear to be those concerned with verbal (and other) mediation and secondary generalization, concept formation, and symbolic behavior in general. However, as the next section demonstrates, experiments derived analogically from behavior theory have not been limited to "pure" learning nor to purely "cognitive" processes. Some of the behavior theory oriented investigators have also utilized field theory technics, which in some senses at least seem more directly related to "real-life" social situations than the traditional conditioning technics. (See, for example, Chapter 5 of this issue of the REVIEW.) The results of such experiments (18, 32, 40, 44, 45) have been very promising.

The Sears-Iowa Doll-Play Studies

Only those studies from the extensive series related to the methodology of doll-play which are derived or semiderived from theory, or that have theoretical implications are discussed in this section. It is difficult to place the doll-play studies within a given framework, as the interests of the workers have reflected a variety of theories including behavior theory and the frustration-aggression subsections of it as well as psychoanalytic theory. The doll-play technic itself has been intensively studied, and the influence of various methodological variations has been explored. In general, the technic is sufficiently familiar not to need review here.

One of the earlier theoretically applicable studies was that of Bach and Bremer (4) in which the authors were interested in whether the fantasy doll-play could be more adequately accounted for by (a) a psychoanalytically derived theory of delinquency based on unconscious desires to punish parents, or (b) the frustration-aggression hypothesis of behavior theory. The authors' conclusions were essentially in line with predictions

which might have been made from behavior theory; for example, delinquents showed no more fantasy instigation toward father dolls, appeared to be poorly "identified" with them, and tended to anticipate little punishment from them.

Bach (3) also investigated father-fantasies and father-typing in homes with father absent. He concluded that the absence of the father, when this absence was service connected and the mother presented a favorable picture of the father, resulted in idealistic and "feminine" fantasy pictures of the father as compared with a matched group of six-to-ten-year-olds with the father present in the home. The control subjects elaborated the fathers' aggressive tendencies. Bach concluded that when the father was absent, there was less instigation for aggressive fantasies and that the deprived or frustrated drive for paternal affection provided strong instigation for idealistic, wish fulfilling fantasies. In this study, theory as it might have been derived from a behavior-system appears to have been supported.

Sears (75), in a paper in which several studies were summarized, quoted doll-play findings which supported the hypothesis of more rapid reduction of anxiety than of aggression, due to differences in steepness of their gradients of generalization. This is a theoretical position deduced in connection with the classical frustration-aggression hypothesis and related to behavior theory. Findings with preschool children in several studies supported this at a modest level of confidence: severely punished and frustrated children utilized parent dolls less as objects of aggression, altho they showed more fantasy aggression; they gained more rapidly thru two play sessions—where fantasy aggression was not punished—in their use of the parent dolls as recipients of aggression than did less punished and frustrated children. Analogical support for the behavior principle of stimulus generalization in the area of complex social behavior was also provided by the studies reported in this paper.

In another paper, based on observations of 42 three- and four-year-old preschool children, Sears (73) found support for a learning theory of dependency, altho his relationships thruout the study were low. Second children showed less dependency than first children. First children appeared to be more frustrated because of such impositions as rigid eating-scheduling, than second children. This reduction of goal attainment (both mother contact and food-getting goals) seemed to increase anxiety, which in turn increased drive, which in turn increased the instigation to mother-controlling behavior (that is, dependency behavior) as a means of satisfying the two original drives, as well as of reducing anxiety. The generalization gradient was considered to serve as the mechanism for the transfer of this behavior to more general social situations where unsatisfied drives existed and/or where mother-surrogates were present. These data were based on maternal interviews, teacher (preschool) ratings, and observations of the concerned children.

Pauline Sears (72) in a long, seminormative study of the doll-play of 150 three, four, and five-year-old children, mostly lower middle-class,

reported findings fitting a general social-learning, behavior theory point of view: representatively, boys showed more rough physical aggression than girls, girls showed more verbal aggression, but less total aggression; children first in birth order showed less aggression than children second in birth order; boys with father absent showed less aggression than boys with fathers present, and boys were affected more by fathers' absence than were girls.

In summary, the Sears-Iowa Doll-Play studies have provided an apparently extremely useful methodology in that the fantasy behavior shown in doll-play has showed consistent relationships to more difficult-to-observe "real-life" behavior. Results from the studies in general have been interpreted to support hypotheses derived by analog from behavior theory and applied to complex human verbal, fantasy, and social behavior.

Lewinian Field Theory

Modern field theory is perhaps best represented by Lewin and the topological movement. However, topological adherents are primarily engaged at this time in action and group dynamics research for which the theoretical relationship is very nominal. None of this later type of research is reviewed here, altho it represents interesting and useful work.

Lewin followed at least three major Gestalt principles: the irreducibility of at least some relations, both epistemologically and introspectively; the abjuration of an elementaristic and mechanistic science in favor of a doctrine of wholes (the individual as inseparable from his environment); and, as a derivative of this, a modification of the classical Gestalt isomorphism (Lewin's isomorphism seems to have been a correspondence between the psychological life space and "reality" or the physical life space). Additionally, he was relatively little concerned with problems of learning and antecedent conditions in the behavior theory sense of the word, but extremely interested in environmental forces as impinging on the individual and in problems of motivation.

A Representative Topological Study

Perhaps the most rigorously derived experiment of the topological series is Kounin's paper (41) on rigidity and satiation. Briefly, Kounin assumed from Lewinian theory that the mentally defective has life space regions separated by relatively impermeable barriers (a special case of rigidity being a function of CA). This being true, less co-satiation (satiation of adjacent regions as a result of a repetitive task) should occur for older feeble-minded than for younger of the same MA, and less for the feeble-minded than for normals with similar MA's. In general, experimental results were in line with theory. Kounin inferred strengths of the intervening variable of rigidity from antecedent conditions (mental deficiency of two durations as contrasted with normality). He specified the way

these antecedent conditions would influence the dependent variable and defined this dependent variable (rigidity) experimentally. There is, of course, only a very rough scaling of the antecedent conditions (old and young feeble-minded and normals), and neglect of motivational factors which may have been introduced as a function of different durations of institutionalization or its lack. But despite criticisms which have been levied against this research, it remains one of the better examples of quite rigorously derived theoretical research.

The bulk of topological research has concerned itself with inferring a hypothetical life space from certain types of behavior elicited from defined types of situations (such as classical frustration, stress, autocracy-democracy, incompleteness of tasks, and level of aspiration techniques). The antecedent conditions which may influence the hypothetical life space typically have not been specified by other topological workers as they have been by Kounin. Hence generalizability of findings and predictability have suffered, altho many ingenious experimental procedures have been introduced into the literature. Topology in general has been of real heuristic value.

Some Theoretical Interpretations of Frustration Behavior

Perhaps the most widely known treatment of the concept of frustration is the frustration-aggression hypothesis proposed by the Yale group (19). Briefly, this theoretical position has maintained that the "strength of instigation to aggression" is related, as far as antecedent conditions are concerned, to (a) the strength of the tendency to make the frustrated response, (b) the extent to which the response is thwarted, (c) the number of frustrated response-sequences, and (d) the strength of competing tendencies resulting from the anticipation of punishment. On the consequent side, the authors have been concerned mainly with the occurrence of aggressive behaviors, but it should be noted that they did not, as is widely believed, propose that aggression was the sole consequence of frustration.

Lewinian theory, as developed by French (24), proposed that an emotional stage called "frustration" results when two opposing forces, one of which is a restraining force, are present. On the antecedent side the strength of this state is a function of the strength of the weaker of the two forces when the weaker is greater than a certain minimum. Among other things, the emotional state is said to lead, consequently, to aggression, regression, physical strain, and tension.

Recently, Brown and Farber (8) formulated a theory of frustration couched in Hullian terminology which warrants careful consideration. Frustration is conceived of as a hypothetical state or condition of the organism (as contrasted with the situation or event which produces the state) developing under any circumstance which hinders or prevents the occurrence of a response, and is shown to result, specifically, from either (a) the simultaneous activation of two competing excitatory tendencies

(sEr) or (b) the presence of a single excitatory tendency (sEr) and an opposing inhibitory one (sIr). The two major effects of frustration, according to the theory, are the production of an irrelevant drive (D) which combines with the relevant drive (D) to produce the effective drive (D), and the generation of frustration stimuli, which may have innately associated response tendencies or new associative connections acquired through processes of learning. The nature of the one or more observable responses which appear consequently depends on the relative strengths of their excitatory tendencies. Admittedly incomplete, the theory is nevertheless of considerable importance, to the degree that it can generate a large number of hypotheses that can be tested empirically.

Additionally, Sargent (71) has published a general, critical, and evaluatory paper, and Lazarus, Deese, and Osler (45) have very recently published a general summary of findings with reference to stress. These papers, along with the two mentioned above, approach the problem from different theoretical points of view, but are in general agreement on several points: (a) that frustration is emotion, (b) that frustration research provides support for the notion of schematizing frustration as an intervening variable, and (c) that research work deriving from a theory of frustration is basic to the psychology of learning and personality. The Brown and Farber (9) paper provides, in addition, a valuable criticism of various theories of frustration (Lewinian frustration-regression and Maierian frustration-fixation theory, among others).

Topological Frustration-Failure Studies

The frustration-failure experiments, like the doll-play studies, relate to modifications of field theory, to the frustration-aggression hypothesis, which is related to behavior theory, and indirectly to psychoanalytic theory. Some of the studies have already been reviewed as a part of the section on the Sears-Iowa Doll-Play studies.

French (24) and Wright (95) both worked within the topological framework, the former with groups of male adolescents, some precollege, some in college. He studied the effects of an organized group (boys and young men who had known each other prior to the experiment) as opposed to an unorganized group (young men unknown to each other prior to the experiment). The former showed more equality of participation, more interdependence, more attack on obstacles and barriers, less social restraint, and other representative behavior. Wright's study with preschool (b) weak friends, and (c) in isolation, is too well known to be reviewed in detail. Briefly, frustration decreased constructiveness most when the child played alone and least when he played with strong friends.

Even better known is the classical frustration-regression study of Barker, Dembo, and Lewin (5) in which frustration markedly reduced the constructiveness of play, as rated from protocols, of preschool-aged children.

Another familiar study is that of Meyers (54), where the effect of different degrees of agreement and conflict between adult commands upon preschool children's behavior was analyzed.

None of these studies is particularly crucial for topological theory; all furnished ready generalizations for the social scene (with attendant possibilities for the carrying of excess meaning); all were ingenious.

Frustration and Training

A second type of frustration-failure experiment involved the investigation of previous experience upon reactions to failure. Davitz' (18) recent paper is a relatively good illustration of the procedure, altho some of the generalizations he made from the study and some of the applications to existing theories he formulated were questionable. Briefly, he trained two groups of children differentially. One group was trained in a cooperative fashion prior to frustration; the other group was trained to compete aggressively against each other prior to frustration. No pretest differences in cooperativeness and aggressiveness existed, but differences after training were significant in the predicted direction.

Davitz concluded that he had provided evidence counter to the Sears and others frustration-aggression hypothesis, the Lewinian frustration-and others frustration-aggression hypothesis, the Lewinian frustration-and others frustration-aggression hypothesis, the Lewinian frustration-and others frustration-aggression hypothesis, but that regression theory, and the Maier frustration-fixation hypothesis. Insofar his data supported Shaffer's frustration-adjustment considerations. Insofar as the last-named regards learning as influencing frustration behavior, it is supported. However, none of the other theories of frustration disregards learning, particularly the frustration-aggression hypothesis which is rooted in reinforcement learning theory. The present authors feel that the study is a useful one, but that it is not theoretically crucial in any sense other than that it demonstrates the influence of previous positive reinforcement and previous building up on inhibition of instigation to aggression, upon frustration-produced behavior.

Goal Attainment

Filer (23) recently published a well-done, theoretically grounded paper in this area. His hypotheses were that a goal object obtained as a result of conditions which the subject thought demonstrated real ability on his part would increase more in attractiveness than one the attainment of which was believed not to involve such merit; that where no expectation of gain- ing the goal object was held, its gain in attractiveness would be greater than when its attainment was expected; and more inclusively, that attainment would produce increments in object attractiveness whereas failure to attain would produce decrements. Only the last of the hypotheses was substantiated. There were only inconclusive differences between well and poorly adjusted subjects as judged by the California Test of Personality. Second- and third-grade children, 160 in number, were used as subjects.

Frustration-Aggression-Repression

Graham, and others (32), in a study of 106 adolescents by the use of verbal "incomplete situation" technic, supported the frustration-aggression hypothesis that the strength of instigation to aggression in an individual is a function of the strength of the stimulus to aggression, where this latter is not sufficiently threatening to inhibit aggression thru fear of punishment (as of course it would not be in the hypothetical, verbal situation used by these experimenters).

Rosenzweig (65, 66), Sanford (68), and Sanford and Risser (70) explored the "remembering-forgetting" behavior of children (and, in some case, adults) confronted with tasks designed to present "ego-threat" (hence to produce ego-defensive behavior). They also studied simple blocking, presumed to elicit need-persistent (or continued-attack-on-the-problem) behavior. There has been some disagreement between Rosenzweig and Sanford with reference to the preferential forgetting of incomplete (failed) tasks as opposed to completed (successful) tasks. Sanford (68) considered the data carefully and apparently has reconciled their findings with the general conclusion that failures are more likely to be remembered with advancing mental and chronological age (presumably accompanied by increasing ego strength); and that successes are preferentially remembered at the earlier mental and chronological ages. In general, there seems to be more self-defensive forgetting (that is, forgetting of failures) for tasks designed to be ego-involving, particularly where the need to regain self-esteem is maximized and the possibility for achieving it is minimized.

Miscellaneous Frustration Studies

Thiesen and Meister (85) used well-quantified and controlled methodology with 10 children. They found that those children with the highest levels of aspiration showed the most severe reactions to frustration as evidenced by maladaptive behavior; the less well-adjusted showed more maladaptive reactions than the better adjusted.

Gatling (26) tested certain deductions made from Rosenzweig's extra, intra, and impunitive theory of frustration, that is, that a group of delinquents (who are, traditionally, "actor-outers") would show more extra-punitive responses following frustration than would a group of nondelinquents. His data showed the former to be extrapunitive as a group, the latter intrapunitive.

Finally, Sherman (77) tested the hypothesis frequently advanced that schizophrenics are nonreactive to their environment, normals intermediate between them and neurotics, and the neurotics hyper-reactive, but inappropriately so. He investigated the "frustration thresholds" of normal, neurotic, and schizophrenic children and adults, using as his criterion of frustration threshold the task difficulty level at which disruption of inte-

grated behavior occurred. In line with his predictions, the schizophrenics showed the highest threshold level, the normals were intermediate, and the neurotics lowest and most variable.

Summary of Frustration Studies

It is the opinion of the authors that the area of frustration-failure includes some of the most carefully done and fruitful theoretical experiments in the field of child psychology. The tendency seems to be for the experiments to be increasingly theory-oriented; some excellent general theoretical papers which should prove useful guides for future research have resulted from consideration of the research. The most hopeful future development would seem to be a concentration on theoretical research.

Level of Aspiration Studies

Level of aspiration concepts have resulted in considerable research with children. This research was reviewed by Lewin, Dembo, Festinger, and Sears (48) up to approximately 1943. Three representative later studies with children serving as subjects have been chosen for summary here.

Adjustment and Level of Aspiration

Two of these studies considered adjustment and level of aspiration. The first, by Gruen (34), involved an upward selected population at the upper and lower extremes of adjustment as indicated by the *Rogers Test of Personality*. She failed to give the sex distribution for the two criterion groups. She found significantly lower mean D-scores, but consistently higher mean average D-score deviations for the poorly adjusted as compared with the well adjusted. She concluded that the former showed compensatory and/or failure-fearful reactions to failure characteristically. Only the maladjusted group showed negative discrepancies. The well adjusted were more realistic. The study contains some misuse of the *chi-square statistic*; failure-reaction conclusions were based on them.

Escalona (22) in a study of children from two schools with very different curriculum orientations, using graded puzzle series, arrived at results relatively close to Gruen's. In a provocative section of her monograph she made a field theoretical analysis of her results and their implications. Neither the sexes nor the schools were evenly distributed in her well-poorly adjusted groups, and few statistically significant results were obtained on which the relatively broad generalizations were based.

Goal Attainment and Level of Aspiration

Child (14) in a study departing in part at least from topological "barrier" theory, investigated children's preferences for easy versus diffi-

cult goals. He found that with increasing age, children tended more to choose difficult goals; women experimenters produced more attempts, relatively, at difficult goals than men experimenters; availability made distant goals more attractive than when the pathway was less available; and boys more than girls strove for the distant goals. Child pointed out some sociological determiners arising thru communication, but these factors were not thought seriously to affect the results.

Summary of Level of Aspiration Research

These studies point out the fact that level of aspiration studies are not yet soundly anchored in theory. The concept, level of aspiration, remains an appealing one for several reasons: the possibility of assigning excess meaning is always present and unusually tempting because of the similarity between the operations involved in the typical experiment and "real life" situations; this similarity, itself, is another reason for the popularity of the experiment; finally, the technic permits the study of "organism plus environment" in quantifiable fashion. It is not to be gainsaid that the concept and technic remain of heuristic and experimental value.

Personality, Prejudice, and Perception

Linked with field theory are the two groups of papers which might, respectively, be labeled as: (a) personality and prejudice, and (b) personality and perception. The former is considered by many to be a special subheading of the latter. Both areas are popular with socially-oriented, field-theory-oriented psychologists at this time, altho relatively few finished research papers dealing with children have been published so far. In one or two papers the problem area has been approached from a behavior and learning theory point of view, but most of the studies are field theory oriented.

Prejudice and Rigidity

The general hypothesis that extremes of prejudice are associated with rigidity and intolerance of ambiguity arose in large part as a result of investigations carried on at the University of California with adults. Frenkel-Brunswik and her students have tested some of these hypotheses with children. The results of the intensive research which that group of workers has done with children are not at this time sufficiently reported in the literature to be reviewed in any detail. However, a representative paper is the informal summary given by Frenkel-Brunswik (25) where she reported on a number of minor experiments on memory as well as various tests of rigidity and perceptual ambiguity. She stated that her data indicated that the ethnocentric child showed in general a severe

repression of such feelings as aggression toward authority, weakness, fear, and elements of the opposite sex in oneself. She further observed that this was paralleled in an externalized image of these tendencies, which was projected onto others, and in narrowness and rigidity.

As has been indicated, the research data have not been reported in sufficient detail to permit critical review or a data-based evaluation of her general conclusions.

Rokeach (63) reported results tending to support Frenkel-Brunswik's hypothesis of an association between rigidity and high *ethnocentrism*. This paper was vigorously criticized by Luchins (50), to which criticism Rokeach returned a point-by-point rebuttal (64).

Kutner (43) concluded that "highs" as contrasted to "lows" ethnocentrically speaking tended to generalize too broadly and rapidly, tended to think in categorical terms, practiced cognitive distortion in the direction of simplifying and fractionating complex and difficult concepts, and tended toward low tolerance for ambiguity and failure. There were no intellectual differences for a selection of 54 of the 60 children tested. The procedures used to define rigidity were a Weigl-type concept formation test consisting of four deductive and four inductive type riddles (the "highs" doing less well on the latter), and a spatial localization problem. Statistical significances are not given in the paper available for review, but inspection of the data reported indicates that the differences seem to approach significance. Kutner concluded that his data supported the Frenkel-Brunswik and Rokeach hypothesis about the personality correlates of ethnocentrism.

Cowen and Thompson (16) made a more general test of the hypothesis that rigidity is a pervasive personality phenomenon. Their findings supported only very tentatively the generalization of rigidity as a personality characteristic. Matched groups of rigid and nonrigid children (in terms of an Einstellung type test of rigidity) were administered the *Bell Adjustment Inventory*, the *California Test of Personality*, and the Rorschach. The first two revealed no group differences. The Rorschach provided certain results which tended to support the rigidity hypothesis: that is, the nonrigid children at a statistically significant level gave more responses, took less time per response, and took less time to organize their first response. Other differences were found, but the present authors believe that these were a function of the large differences in mean total Rorschach response between the two groups.

By far the majority of the large and extremely interesting literature on ethnocentrism and personality correlates has utilized the ubiquitous college student as a subject and has therefore been excluded from this review. There exist extremely marked discrepancies in apparently similar populations subjected to reasonably carefully worked out experimental designs, and far more research is needed before clear-cut empirical conclusions or theoretical applications can safely be made, either from the literature on children or adults. The social urgency of the topic should prove to be an incentive to production of more research.

Need and Perception Studies

The "perception-personality" studies have in common the general principle that needs result in selective perception, including distortion in the direction of need gratification. As with the personality-ethnocentrism papers, the great majority of research has dealt with adult subjects and falls outside the scope of this review.

Bruner and Goodman (9) tested three hypotheses: (a) The greater the social value of an object, the more susceptible will it be to organization by behavioral determinants (needs, previous learning, and adaptive mechanisms in general). (b) The greater the individual need for a socially valued object, the more marked will be the operation of behavioral determinants (accentuation in this case). (c) Perceptual equivocality (ambiguity) will facilitate the operation of behavioral determinants only insofar as equivocality reduces the operation of autochthonous ("innate" perceptual processes) determinants without reducing the effectiveness of behavioral determinants.

These hypotheses were tested on 30 ten-year-old children, 10 rich, 10 poor, and 10 who were used as controls. Estimates of the sizes of coins with the coin present and absent were made by the experimental children; equally-sized cardboard discs were used for the controls. The technic was manipulation of a lens which focused an approximately circular beam of light on the screen. The experimental results supported the hypotheses, particularly with the coin present.

Carter and Schooler (10) replicated the experiment, refining the methodology and design, and produced some results deviating extremely from Bruner and Goodman's. They used 48 children, nine to 11 years of age, 24 of whom were rich, 24 poor. Briefly, altho every estimate of five coin sizes made with the coin present showed the poor group estimating coins as larger than the rich, only one difference approached significance. In addition the poor group actually estimated two of the five coins smaller than their true size. Approximately the same results occurred when estimates were made from memory. For four of the five aluminum discs, the same size gradient as the coins, the poor children made smaller estimates than the rich, as was true for five of the five cardboard discs. None of these differences remotely approached significance, however. One of the most marked tendencies for both rich and poor children was the tendency to underestimate the small circles, whether coins or discs, and to overestimate the large. Three significant *F* ratios, two of them in the direction of the Bruner-Goodman hypothesis, were reported: (a) Poor children, from memory, tended to report coins as being larger than did rich children. (b) Poor children made a larger mean estimate when asked to estimate the size of an aluminum disc just larger than the paired coin than did rich children. (c) Small objects were underestimated, larger objects were overestimated.

Mausner and Siegel (53) worked from a somewhat similar hypothesis:

the higher the value of an object, the more quickly it will be perceived. They used a tachistoscopically presented series of postage stamps of different purported value, and an adolescent stamp collecting population. The results failed to support the hypothesis.

One of the earliest studies of the effects upon perception of a need was Murray's classical study (57) in which five girls rated photographs as less "good" after a game of "murder" played in the dark than after a pleasurable activity in the sunshine. Another early study was Sanford's (69), where he found that 10 children gave more food responses to a controlled word association list and to ambiguous pictures just before than just after a regular meal.

Learning and the Need-Perception Hypothesis

In none of the experiments quoted in the section just preceding have antecedent conditions been considered except in a rough way (hungry versus nonhungry, rich versus poor, for example). However, Lambert, Solomon, and Watson (44) combined the interests of learning and behavior theory with some of the experimental technics of field theory in one of the more interesting experiments in this area. Their experiment was one concerning secondary reinforcement. Children, all of preschool age, were trained to turn a crank to receive white poker chips, which when placed in a slot delivered candy automatically. Control children performed identically but received the candy without the mediation of the poker chips. The children, with a dial device for controlling the size of a spot of light, estimated the size of the poker chip at the beginning of the experiment, after a series of 10 days of positive reinforcement, again after a single extinction day (no candy), and after one day of resumption of reward. An analysis of variance proved significant for the experimental children: (a) From the first to the second test, a significant increase in estimation of size of the poker chip occurred. (b) After one day of no reward, a significant decrease in estimation of the size of the poker chip occurred. (c) A significant increase in the estimated size of the chip occurred after the day's resumption of reward. None of these differences approached significance for the control group. The general conclusion was that the principles of secondary reinforcement seemed to operate in this situation. An even more general conclusion was that the data supported the hypothesis which provides the core of this section: need influences perception. The study is a valuable one, additionally, in that it is an example of bridging the artificial chasm between field and behavior theory, in that by implication there is some demonstration of the learning both of needs and of complex perceptual behavior.

Without confining himself to the experiments reviewed here, Pastore (59) directed a strongly critical paper against seven of the need-perception studies. He took two tacks, one methodological and quantitative, and the other theoretical. The authors of this review regard the first of the two—

the criticism of methodological flaws—as legitimate and constructive, the second as somewhat tangential. Chein, and others (13) replied to his critical paper more or less point by point, giving a rather reasonable rationale for their methods and an effective one for the theory.

Summary of Need and Perception Studies

As with so many of the field theory studies, the need and perception studies have abounded in ingenious technics which appear to mirror socially meaningful and common human social situations. Typically, antecedent conditions have been lightly stressed. This represents one of the major differences between field and behavior theory studies. One of the most hopeful trends in this area of experimentation seems to the present authors to be represented by the Lambert, Solomon, and Watson (44) paper where antecedent conditions were manipulated and additionally “cross-sectional” or “field forces” were studied, thus helping to bridge the theoretical and methodological gap between field and behavior-learning research, without doing violence to either. In general, considerable confusion exists in the area, which is one of marked social and theoretical usefulness.

Reviews of Psychoanalytic Verification Studies

Two reviews of psychoanalytic verification studies, Sears's (74) general one, and Orlansky's (58), which is restricted to studies with reference to infant handling, have been published, in 1943 and 1949 respectively. In the first Sears reached the conclusion that due to the methods used in psychoanalysis (verbal recall), direct verification studies were almost impossible; but where hypotheses tested by behavioral observation were made explicit (for instance, in the area of regression) moderately positive results had been obtained. In the second review, the conclusion was reached and rather exhaustively documented that no substantial evidence for the psychoanalytic paradigms of infant care and training had resulted from research in the area. Readers interested in psychoanalytic verification studies are referred to the full treatments given in these two publications. This review, in general, is concerned with more recent articles and with verification studies done, for the most part, only with children.

Infancy and Environmental Feeling Tone Studies

Lowrey (49) studied children admitted to the psychiatric service of the Brooklyn Hebrew Orphan Asylum, after having been residents for some time in conventional infant wards. He noted much disturbed behavior and recommended a “cushioning” group—residence in a semitherapeutic small group “home” such as he operated before home placement. This, he

believed, produced real reversals in the adjustment of the children whom he described.

Levy (47) investigated the developmental status of children who had had more or less prolonged stays in infant nurseries as contrasted with children who primarily had lived in boarding homes since birth. Generally, the longer the infant ward placement, the more retarded the children. All trends were in the predicted direction, altho not all were significant statistically.

Spitz (80, 81, 82) has published a series of papers referring to children who have spent material amounts of time in infancy in infant wards, finding them much retarded where no consistent "mother figures" were present. This retardation was attributed by Spitz to lack of emotional relationships with a meaningful adult, either due to such a figure being totally absent or very inconsistent. Subsequent publications, based on clinical observations (79) documented head banging, anaclitic depressions, etc., as resulting from varying patterns of maternal-infant interrelations, or their lack.

Unanswered questions about the Spitz research, challenging as it is, have to do with: (a) the great difference in Development Quotient according to socio-economic level in the first year as reported by Spitz where such differences have not been found in infant intelligence test normative studies, where the methods of scale administration were more carefully described; (b) in ascribing to lack of emotional relationship the retardation of developmentally depressed groups, where the ascription could be equally pertinently made to the factor of sheer lack of stimulation and experience; and (c) finally, to the nonquantitative methods of study used.

Goldfarb (27) reported on an experimental group who entered an institution at the mean age of 4.5 months, remaining for an average of three years and three months. A closely matched control group of slightly less adequate heredity, in terms of mothers' occupational status, was used, who had essentially life time experiences in families (10-14 years). Foster homes were reported to be equivalent socially, economically, and culturally. The administration of the Rorschach test to the two groups, with chi-square analysis of the data, showed 7 of 21 categories to differ significantly ($P = 5$ percent or less) for the two groups. In general, as far as the attribution of adjustment significance to these differences by Rorschach experts is concerned, the children who had spent long periods of time in the institutions were inferior to those who had spent the time in family homes. Illustrative differences were five institutional children of seven showing CF greater than C as compared with one of the foster children from nine available for analysis; three institutionally reared children, but no foster children showing pure C responses, etc.

This paper has been reported also apparently by Goldfarb (28) and by Goldfarb and Klopfer (29). The criticisms of the paper have to do with questions of reliability of interpretation and scoring of the Rorschach, the uncritical equating of Rorschach signs to other behaviors defining

goodness or badness of adjustment, the degree to which knowledge of the group to which the child belonged may or may not have influenced Rorschach interpretation and scoring, and the clinical usefulness of the results for dealing with an individual case.

Finally, Holway (38) found an insignificant rho coefficient between maternal reports of feeling tone and reality behavior of their children on a Sears-Iowa type play interview. She also demonstrated a relationship between feeling tone and fantasy, altho both rhos were in the predicted direction (+.38 and -.34 respectively).

Altho the methodology of these studies has been generally faulty and altho the authors infuse values into the discussion sections of their papers, the comparability of the results (constituting in a loose sense validation by replication) cannot but affect the practical worker with the very young child in the direction of utilizing extreme caution before recommending protracted residence in an infant ward.

Specific Infant Handling Practices

Orlansky (58) has reviewed this literature intensively. Representative papers include those of Maslow and Szilagy-Kessler (52) in which a curvilinear relationship between duration of breast feeding and scores on a security-insecurity test was found. College-aged male youth, mostly second generation American, secured data on their own upbringing from their mothers, and also took the security-insecurity test. Peterson and Spano (60) found no relationships between breast feeding, maternal rejection indications, or child personality.

Goldman (30) reported that early weaning from the breast (up to four months) as opposed to late weaning (five months or more) tended to result in "oral pessimism" to the extent of a correlation of .27 for 100 adult subjects. Goldman's data concerning weaning was gathered from mothers of the subjects and from rating scales for 19 traits from the subjects themselves. Late weaning showed a correlation of .37 for the same subjects, and the same type of data collection was utilized. This study had many of the defects of the Maslow-Szilagy paper, and the degree to which weaning data were known at the time the oral-pessimism-optimism scale was devised is not reported. Additionally, the correlations, while significant at less than $P = 1$ percent for this N , are not materially constructive in individual prediction.

Goldman (31) also reported that factor analysis of the 19 traits mentioned above revealed two factors, the first of which was significantly related to early weaning but poorly saturated with impulsiveness, aggression, and autonomy, which traditionally are associated with oral character. The other factor, highly saturated with these traits, was not related to early weaning. The author suggested that early weaning and a combination with impulsiveness-aggression may promote the development of oral pessimism.

Davis and others (17) reported on 60 babies divided into three equal groups, one fed by cup, one by bottle, and one by breast during their first 10 days. A sucking test, observations of spontaneous oral activity, time samples for crying, and evaluations of enjoyment of food composed the data. Psychoanalytically, it would be predicted that the cup-fed babies would show more nonnutritional sucking and more emotional disturbance than breast- or bottle-fed babies. Learning theory would predict that the latter two groups would develop more sucking behavior, regardless of type, than would the cup-fed babies. The breast-fed babies did develop stronger sucking reflexes than the other groups, which were not significantly different from each other. There were no group differences in spontaneous oral activity or amount of crying, altho the breast-fed babies showed slightly higher general body activity in their last five days and slightly poor appetites on the first three days. The study in general is carefully done methodologically but fits poorly with both straight psychoanalytic and learning (analogical) predictions.

Sears and Wise (76) found that late weaning produced greater appearance of frustration-behaviors, that the oral drive to a degree was secondary, in that it was strengthened by prolonged sucking-type feeding, and that no conclusion as to advisability of types of feeding could be gained from their data. However, there was some suggestion that late weaning was related to a greater incidence of thumbsucking than early weaning (contrary to psychoanalytic predictions).

Thurston and Mussen (87), in another study done with college students and data about feeding practices gained from their mothers, found no relationship between TAT need-press oral scores and lack of infantile oral gratifications. If anything, the highly gratified group showed more traits judged to jibe with an oral personality than did the little-gratified group. The study was carefully quantified.

Holway (38) in the study mentioned previously found that three of the five relationships between degree of self-regulation which had been permitted, and the number of realistic play factors shown by preschool children were significant at less than the 5 percent level. Mean differences between five self-regulated and 12 nonself-regulated children in both reality play in a Sears-Iowa type doll-play situation (less for the nonself-regulated) and fantasy (more for the nonself-regulated) were significant at less than the 1 percent level. Sum of aggression-fantasy-tangential scores also differentiated between the two halves of the bowel-training distribution, as did division into long- and short-times breastfed for reality and fantasy scores.

Criticisms of the study include the small number of subjects and their extreme upward selection. Actually, the nonself-regulating mothers may, in terms of the Detroit Cornelian Corner philosophy, have felt very guilty about the way they had reared their children. There was at least one case of "contamination"—the experimenter knew the child's training background. Additionally, the 90 percent agreement in scoring protocols from

two observers, reached by the experimenter and a co-worker, was reached after discussion of each half-minute of the protocols and the rejection of an unstated number of half-minutes of data. What effect some systematic theoretical bias may have had on this procedure is unknown. Finally, rating scales used by the mother may have reflected subtle psychological factors in the mother quite unrelated to actual practices which she may have used with the infant, and, additionally, were of unknown reliability.

Bostock (7) studied relationships of breast feeding and toilet training to later enuresis, finding no relationship between the first and third. However, rigid toilet training was strongly associated with later enuresis, and type of toilet training was found to be related to acceptance of the child. An unpublished study by McCandless (51) showed a consistently significant relationship for two populations between type of toilet training (bladder control) and length of time required for the child to achieve control, where the more permissive training produced results more efficiently. The results of these studies, while not in opposition to psychoanalytic theory in their significant results, also fit easily with behavior theory and with the general pattern of results obtained from frustration studies.

Another study is relevant here, altho the subjects were not children but college students. Levy and McCandless (46) using electric shock for 45 young adults, approximately two-thirds of whom were women, and a modification of the Wisconsin Card Sorting technic, concluded as follows: that where a "pattern of behavior" was provided in a training series, even tho it later failed to fit or help in the solution of a punishing, undifferentiated situation, it transferred into still a third situation and increased accuracy of prediction of shock, and resulted in less frequent prediction of shock and quicker learning than was the case with a group where the punishing, undifferentiated situation was presented first and the "pattern of behavior" second. This latter group, actually, handled the third, or test situation, no better than a group which had had no "pattern of behavior" at all taught to them. The authors stated that, granted certain assumptions, "one may by successive stages of induction arrive at the stricture, 'Give the child techniques for solving his problems'" (46:525). Additionally, "Similar inductive steps would lead to the axiom relating the 'toughness' of childhood traumas to difficulties in later adaptive learnings" (46:525).

The results of this experiment were compatible with psychoanalytic postulations about the enduring effects of experiences occurring in a poorly structured situation, and, insofar as childhood may be thought of as a time when "structure" is less adequate than it later becomes, might cautiously be generalized to early childhood.

Sex Awareness, Identification, Parental Preference Studies

Freud's concept of the oedipus and general personality theory hypothesizes that appropriate sex identification is essential for adequate, adult adjust-

ment, has stimulated much research. Little of this is experimental, and actually much of the writing in the area is purely speculative. Typical research is normative in type and is not considered here except for a representative sample or so.

Conn (15), for example, using play interviews found game preferences sex-typed in an overwhelming number of cases aged 4-13 years. Rabbian (61) in a carefully done study found sex awareness developing rapidly with age after age three, with social class differentiations. The fourth and fifth years were times of rapid growth in clarification of sex role for lower-class boys, the sixth for middle-class boys. Lower-class girls accepted sex appropriate patterns by age six, but middle-class girls did not clearly sex-type themselves even by their eighth year. The mother was preferred by both sexes in the early years. Radke (62) presented data in detail about parent behaviors and preferences. Rabbian cited these to account for some of the factors disclosed in his research. Weider and Noller (91), using children's drawings of human figures, curtailing the IQ range and prescribing the socio-economic class of their subjects, found both sexes drawing more sex characteristics (at a statistically significant level) for their own-sex figure the lower down the socio-economic scale they were classified, with a tendency shown in the same direction for the opposite-sex figure. This last tendency was not significant for girls. There were no significant differences between number of sex characteristics drawn into the figure for own sex-figure between boys and girls. Thus, to a degree, the Rabbian findings were extended.

Erikson (21) studied sex differences in play configurations in approximately 150 preadolescent play sessions. His findings were considered by him to represent biological determinism, the play interests being analogs to the physiology and function of the sex organs. These conclusions were reached by inductive stages from independent judges' (two in number, one male, one female) classification of play incidents.

Ammons and Ammons (2) found preschool children's parent preferences were somewhat inconsistent. Contrary to oedipus theory, like-sex parent preferences were apparent at three years, and parents were differentially preferred, mothers for care, fathers for play and reading. Parent preference was also inversely related, according to which parent administered punishment. This study served to emphasize cultural determinism more than a simple and universal oedipal phenomenon, as do the interesting studies of Winch, of which 92 and 93 are representative. A questionnaire survey was made of more than 1000 midwestern college students, on the assumption that where the like-sex parent was missing from the home, heterosexual maturity (courtship behavior) would be retarded. In general, this hypothesis was supported by the men's but not the women's data. Winch also introduced social-learning phenomena to explain his results: courtship behavior for males involved breaking maternal dependency; but for women may have resulted merely from transferring dependency from father to husband.

Cass (11, 12) devised a highly objective measure of maternal awareness of the child and considered the existence of this awareness as a reinforcement to the child. She investigated the relationship between awareness and identification of the child with the mother, finding for a "normative" group of socio-economically upward selected boys and girls a correlation of maternal awareness and identification of .59 for girls and .17 for boys. She also found low awareness and high control on the part of the mothers to be significantly related to parent-child conflict, when compared with mothers showing high awareness and relatively high control scores. Cass's study provided an objectification of instruments and definitions rather unusual in the field, altho her instruments, as she recognized, were designed so as, in all likelihood, to lower boys' identification correlations. Her findings may be inductively considered to be in agreement with the predictions which could be made from psychoanalytic theory, or from a reinforcement type of behavior theory. Her preference was for the latter.

Finally, Stoke (83) in a constructive general paper which should be read by any person planning research in this area, criticized existing "identification" research and listed 10 factors which he believed influenced identification and which he thought could be objectified and verified.

Miscellaneous Psychoanalytic Verification Studies

Two studies, one on maternal labor designed as a test of the Rankian birth trauma hypothesis, Ruja (67), and one on maternal attitudes during pregnancy as related to adjustment in the first six months of the infant's life, Wallin and Riley (90), have not proved to be conclusive, and there were serious flaws in the designs of both.

Two recent allergy studies have been selected as representative of psychosomatic research. Harris and others (37), endeavoring to keep contamination at a minimum and to achieve a maximum of case history accuracy, reported on the hostility, crying, and confiding behavior of asthmatic and allergic rhinitic children. Teachers' ratings showed less open aggressive behavior for the asthmatics than the rhinitics and less referred to another agency for problem behaviors. Rejection seemed significantly more frequent for the experimental than for the control group. Asthmatics also seemed to show greater difficulty in crying and in confiding in the mother than did the rhinitics.

The study fits approximately with the psychoanalytic theories of the dynamics of asthma, yet differing psychological dynamisms were not related to response to treatment (open expression of aggression theoretically should yield better prognosis for treatment). There were some difficulties also of selection of the subjects as far as the design is concerned. Finally, the comparability of the experimental and control subjects left much to be desired.

In the second study, Miller and Baruch (56) reported on allergic compared with nonallergic children referred to them for behavior difficulties. Significant differences were found in the direction predicted by psychoanalytic theory in direct, indirect, displaced and self-directed hostility between the two groups as far as office behavior, parents' reports, school reports, and separately statistized play sessions were concerned. Reliabilities of play interview observations were not reported, and room for unconscious biases in categorization of play, office, etc., behavior was left in the experimental design (presumably the experimenters were well aware of the diagnostic group to which the children belonged.)

Harlow (36) extracted 18 variables from a TAT and Sentence Completion Test which he related to psychoanalytic theory. He used these to "explain" men with extreme awareness of secondary sex characteristics, particularly musculature. Weight lifters, he believed, represented such a group, and 20 of them were compared with 20 nonweight-lifting athletes of similar general characteristics. Thirteen of the 18 variables distinguished significantly in the direction of prediction. Among his conclusions were listed failure of the weight lifters to identify with an adequate male, underlying dependency feelings, abnormally acute feelings of masculine inadequacy, and exposure from early in life to a depriving and frustrating environment, with excessive amounts of narcissism.

It is perhaps worthwhile to list the necessary logical steps in this paper, as the study was rather carefully done and the logical procedures necessary for it are relatively typical of studies or experiments purported to test psychoanalytic theory. These steps represent the present authors' analysis and were not stated by Harlow. First, the psychoanalytic definitions of several concepts, such as overcompensation, identification, repression, and narcissism must be set forth in general terms. These must then be translated into projective material content (in this case, the TAT and Sentence Completion Test). This, typically, is done by observer analysis and agreement. Next, by another set of operations (social behaviors) a group is chosen whose "core" behavior presumably represents another definition (or "outcome") of such concepts as overcompensation and identification (weight lifters in this case). If correlations between weight lifting and the TAT, SCT variables are found to be significantly positive, the inference is made that validation of the concepts of overcompensation, etc., has been achieved. Since these have now been supported, certain circumstances of childhood learning responsible for them are derived (assumed to have occurred); and, this last "being true," with the end results as measured, the psychosexual stage theory of personality development is held to have been validated and the criterion behavior (weight lifting) "explained." Such a process seemed to be what Sears (74) had in mind when he concluded that direct test of psychoanalytic theory is well-nigh impossible, and that more fruitful approaches should probably be used.

Studies of Childhood Memory

A keystone of psychoanalytic theory is the concept of repression, and one of the most frequent methods of studying repression has been the eliciting of early memories. Three studies are cited here as representative of the literature since 1941 when Dudycha and Dudycha (20) reviewed research on childhood memory. Waldfogel (89) asked adults to record as many memories as they could. His figures for pleasant versus unpleasant memories (50 and 30 percent respectively) were in line with repression theory, altho not to the predicted degree. But his conclusion was that the variety of memories and presumed early chronological age from which many of them date were factors that cast serious doubt on the theory of infantile amnesia (repression). He found that some individuals reversed the pleasant-unpleasant trend and suggested the terms of "memory optimist" and "memory pessimist." The method of accurate placement of the memory under consideration in this study, as in most, was dependent upon the subjects' statements, which in turn presumably were influenced by all the dynamics of condensation, distortion, repression, etc., which were being tested.

Thompson and Witryol (86) asked college girls to recall the unpleasant things which had happened to them in: (a) their first five years of life, (b) between 6 and 12, and (c) between 12 and 18. The 50 girls in each of the three groups were reasonably closely matched. A total of 721, 803, and 735 memories were recalled for each of the three age periods. This finding also reflects negatively on the notion of infantile amnesia, altho the method of age placement of memories is subject to the same criticism as was made above for Waldfogel's study. The authors' findings seemed to reflect social learning influences: the first age period produced a plurality of unpleasant sensory and emotional memories (41 percent); the second of unpleasant experiences during the process of learning to live in a social world (43 percent); and the third of experiences producing a sense of inadequacy and inferiority (46 percent).

Finally, Turner and Barlow (88), in a critical, methodological study involving introductory psychology students found that the order of requesting memories determined whether more pleasant or unpleasant memories were recalled (more pleasant if pleasant were requested first, and vice versa). They also demonstrated that the primary factor in recall seemed to be intensity, where the more intense experiences, regardless of their pleasant or unpleasant nature, were recalled earlier than less intense experiences. Questions concerning order of requested recall and degree of intensity have not been controlled adequately in most studies, and in few if any has accurate age placement of the memories been made.

The childhood memory area, in other words, has produced results which support moderately the psychoanalytic conceptions of infantile amnesia and repression; but the degree of fit manifested (that is, most studies have found more pleasant than unpleasant memories recalled) must be viewed

skeptically due to common methodological errors (and difficulties, such as age verification of a given memory).

In a study somewhat more directly designed to test the theory of psychosexual stages, particularly pregenitality as a presumed index of immaturity, Miller and Stine (55) judged the degree and stage of pregenitality represented in elementary-school children's endings to incomplete stories. In general, degree of pregenitality was negatively related to social acceptance as judged psychometrically. However, many isolates secured low pregenital scores. They were thought to be good "potential leaders" who at the time of the study were too mature for the group. High anality scorers also proved to be unexpectedly acceptable to the group. Anality is accompanied by behavior thought to be valuable in latency, according to the authors.

Summary of Psychoanalytically Derived Studies

It seems to the authors that psychoanalytic theory has stimulated some useful and interesting research; that this research has seldom if ever been a direct test of the theory (partly because the theory is so difficult to translate into testable concepts); that there have been many loopholes in the research which has been done; and that the adduced and tested hypotheses have fared little better than chance as far as support is concerned. There is also a serious question in the authors' minds as to whether those hypotheses which have been supported could not more economically have been derived from behavior theory, or reduced to it, as the case may be.

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¹ Corrected to December 1, 1952. Report errors immediately to the secretary-treasurer.

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